Environmental Impact Analysis Process

PRELIMINARY DRAFT
Environmental Impact Statement
for the Closure of
Mather Air Force Base

JUNE 1989

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS, AIR TRAINING COMMAND
RANDOLPH AIR FORCE BASE, TEXAS 78150-5001

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Air Force
Environmental Planning Division
(HQ USAF/CEVP)

Room 5B269
1260 Air Force Pentagon
Washington, DC 20330-1260

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PRELIMINARY DRAFT
ENVIRONMENTAL IMPACT STATEMENT

CLOSURE OF MATHER
AIR FORCE BASE

June 1989

Department of the Air Force
Headquarters, Air Training Command
Randolph Air Force Base, Texas

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ACRONYMS AND INITIALISMS

AC&W	air command and warning
AFB	Air Force Base
AFR	Air Force Regulation
AFRES	Air Force Reserve
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
ARG	Air Refueling Group
ATC	Air Training Command
BMW	Bombardment Wing
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CLUP	Comprehensive Land Use Plan
CO	carbon monoxide
CRWQCB	California Regional Water Quality Control Board
CY	Calendar Year
CZ	Clear Zone
dB	decibel
DOD	(U.S.) Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	environmental assessment
EIS	environmental impact statement
EPA	(U.S.) Environmental Protection Agency
Fed. Reg.	*Federal Register*
ft	foot or feet
ft^3	cubic feet
FTW	Flying Training Wing
gal	gallon
HC	hydrocarbons
HSWA	Hazardous and Solid Waste Amendments
in.	inches
IRP	Installation Restoration Program
kWh	kilowatt-hour
lb	pound
Ldn y-avg	yearly average day/night sound level
LOS	level of service
mpg	miles per gallon
MSA	Metropolitan Statistical Area
MTMC	Military Traffic Management Command

MWh	megawatt-hour	1
NEPA	National Environmental Policy Act of 1969	2
NOI	Notice of Intent	3
NO_x	nitrogen oxides	4
NPDES	National Pollutant Discharge Elimination System	5
NSC	National Safety Council	6
ORNL	Oak Ridge National Laboratory	7
PCBs	polychlorinated biphenyls	8
ppm	parts per million	9
Pub. L.	Public Law	10
RCRA	Resource Conservation and Recovery Act	11
RI/FS	Remedial Investigation/Feasibility Study	12
SAC	Strategic Air Command	13
SMUD	Sacramento Municipal Utility District	14
sq. mi.	square miles	15
TCE	trichloroethylene	16
TSCA	Toxic Substances Control Act	17
TSD	treatment, storage, or disposal	18
U.S.C.	*United States Code*	19
USAF	U.S. Air Force	20
UST	underground storage tanks	21
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EXECUTIVE SUMMARY

The proposed action evaluated in this environmental impact statement (EIS) is the closure of Mather Air Force Base (AFB), California. The closure results from the recommendations of the Defense Secretary's Commission on Base Realignment and Closure, from legislative requirements in the Base Closure and Realignment Act (Pub. L. 100-526), and from U.S. Air Force plans to enhance mission readiness and national security. Primarily, the closure of Mather AFB will entail relocating the 323rd Flying Training Wing (FTW) to Beale AFB, California; deactivating all remaining Mather AFB support units as appropriate; and excessing base property. No construction or demolition activities are planned as part of the proposed action. Provisions of the Closure Act and the recommendations of the Commission preclude any alternative actions to closure; consequently, the only alternatives considered in this EIS are alternate methods of carrying out the proposed action; currently, the only alternatives investigated are partial closure (closing the entire base except for the Electronic Warfare Officer Training facility) and no action, which is evaluated because of the Council on Environmental Quality regulations. The ongoing closure planning activities may reveal other alternatives within the proposed action—these would be addressed in later versions of this EIS.

The following areas of environmental impact were identified during the scoping process for Mather AFB closure: noise, energy use, air quality, solid and liquid waste disposal, transportation, land use, ecology, and socioeconomics. For these impact areas, the implementation and residual environmental consequences of the proposed action are described and analyzed, and mitigative measures are given.

Noise. Average daily aircraft activity will not significantly increase and will not, therefore, increase noise levels in the area. Ground transport of people and equipment will not add unacceptable noise levels to existing transportation routes, and it will occur at times that are most practicable.

Energy use. The principal energy use resulting from moving the 323rd FTW to Beale AFB would be diesel fuel for transport vehicles. A total of about 27,000 gal of diesel fuel would be needed to carry out the proposed action.

Air quality. Transport vehicle emissions of carbon monoxide, hydrocarbons, and nitrogen oxides would contribute an insignificant fraction (<0.01%) of current estimated mobile source emissions in Sacramento County and thus would have a negligible effect on air quality. Cessation of operations at Mather AFB would reduce current air pollution emissions by amounts ranging from 1 to 3% of total county emissions, and this would have a minor beneficial impact on air quality.

Solid waste disposal. Only an insignificant and temporary increase in solid waste production is expected to result from closure, causing an insignificant effect on the Sacramento County Landfill; after the base is closed, the elimination of solid waste from the base is expected to

have a slight beneficial impact on the landfill. Minor beneficial impacts will also result from cessation of current hazardous waste disposal activities.

Transportation. Because the additional vehicle traffic associated with closure would be <1% of average daily traffic along the proposed routes, no significant impacts are expected. Long-term transportation effects near Mather should be beneficial because closure should result in about 3700 fewer commuters in the area. Transportation of personnel and equipment would avoid existing congested areas to the extent practicable.

Land use. Currently, Mather operations extensively affect land use near the base. Ceasing those operations could allow development of some of that area (with the resulting short- and long-term environmental consequences). Such new land uses would be subject to local and regional land use controls, including a consideration of environmental impacts. It is strongly recommended that any changes in zoning and land use after closure be done after specific reuse options have been identified.

Water resources. Currently Mather operations have minor impacts on surface water quality through the discharge of effluent to a municipal treatment facility (Mather AFB flows are less than 1% of current total levels treated). Withdrawal of groundwater by Mather currently has little discernible effects on groundwater in the vicinity. Cessation of operations would thus result in minor beneficial impacts.

Ecology. Withdrawal of personnel, equipment, and supplies from Mather would not involve any construction, demolition, or dismantlement activities, nor is it expected to produce any liquid effluents. As a result, implementing the proposed action has little potential to affect ecological resources. However, if the current Air Force maintenance of Mather Lake ceases, there will be several effects on lake size, levels, and ecology. It is recommended that to mitigate these effects the U.S. Air Force continue pumping the lake until this activity could be managed by the appropriate state and local agency. Further, effects on the burrowing owl population and vernal pools are being investigated by the California Department of Fish and Game (as a cooperating agency for this EIS).

Socioeconomics. Minor adverse socioeconomic effects could result from the closure of Mather AFB because of the loss of revenues to producers and suppliers of petroleum products and natural gas to Mather AFB. Loss of wastewater effluent to be treated and solid waste requiring disposal would cause short-term decreases in revenues to municipal agencies. However, the economic growth of the region and the small percentage of total wastes (and revenues) contributed by Mather should limit these impacts to minor levels.

1. DESCRIPTION OF AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

On December 29, 1988, the Defense Secretary's Commission on Base Realignment and Closure announced the closure and realignment of 145 military installations to help reduce expenditures without compromising mission readiness and national defense. Of these, 86 are to be closed fully, 5 are to be closed in part, and 54 will undergo a change (i.e., a realignment) in mission and/or personnel. On January 5, 1989, the Secretary of Defense accepted the Commission's recommendations, and in May 1989 they were approved by Congress. One of the Commission's recommendations is to close Mather Air Force Base (AFB), which is located about 12 miles east of Sacramento, California, and to move the 323rd Flying Training Wing (FTW) from Mather AFB to Beale AFB, which is located about 60 miles north of Mather AFB.

The Base Closure and Realignment Act (Pub. L. 100-526) is the legislative result of an agreement between the Executive Branch and Congress to resolve the long-standing base closure issue while still protecting national defense interests. This agreement—which also endorsed the Defense Secretary's Commission—and the resultant legislation established the general guidelines and schedules to be used for the closure or realignment of candidate military installations.

Included in the Act is the requirement that any base closure or realignment actions undertaken by the Secretary of Defense must conform to the provisions of the National Environmental Policy Act of 1969 [(NEPA) Pub. L. 91-190]. As a result, this environmental impact statement (EIS) is prepared pursuant to Sect. 102 of NEPA, as implemented by the President's Council on Environmental Quality (CEQ) regulations and Air Force Regulation (AFR) 19-2. However, the Secretary of Defense requested and subsequently obtained the following modifications to the applicable NEPA requirements:

> . . .the Secretary shall not have to consider—
> (i) the need for closing or realigning a military installation which has been selected for closure or realignment by the Commission;
> (ii) the need for transferring functions to another military installation which has been selected as the receiving installation; or
> (iii) alternative military installations to those selected (Pub. L. 100-526).

Also, the actions of the Commission were exempted from NEPA, and a 60-day limitation was placed on any civil action for judicial review (Commission 1988).

The 12-member Commission on Base Closure and Realignment was chartered in May 1988 by Secretary of Defense Frank Carlucci to identify military installations that could

be realigned or closed. The primary criterion used by the Commission for identifying candidate bases was military value of the installation. However, cost savings were also considered; and the Commission carefully noted the current and projected plans and requirements for each Service, "adhering to the principle of not challenging Service force-structure planning" (Commission 1988). Lastly, the Commission focused its review on military properties and their uses, not military units or organizational/ administrative issues; its evaluation drew upon current information supplied by the Department of Defense (DOD) and resulted in recommendations that identified the 145 candidate bases for realignment or closure.

The Commission recommended that Mather AFB be closed "primarily due to its deficiencies in the quality and availability of facilities and excess capacity within the category" (Commission 1988). The Commission also found that

> The military value of Mather AFB is lower than other flying-training installations. Mather has a shortage of buildings for operational and training purposes, and a shortage of maintenance and administrative facilities. Additionally, the availability of vehicle pavements is less than required. The installation has also had difficulty in hiring civilian workers in the area, due to the demand for technically qualified workers by other industries within the civilian community (Commission 1988).

The Commission also determined that closure would result in "no negative impact on the local environment."

1.2 LOCATION OF PROPOSED ACTION

Mather AFB is located in the lower Sacramento Valley between the Coast Range and the Sierra Nevada foothills, approximately 90 miles northeast of San Francisco and 12 miles east of Sacramento (Fig. 1.1). The established airfield paving elevation varies from 75 feet to 95 feet mean sea level. Its specific location is 38 degrees 33 minutes 13 seconds North latitude, 121 degrees 17 minutes 12 seconds West longitude. The main entrance to the base is less than 1 mile from U.S. Highway 50 (Fig. 1.2). There are four other entrances: Commissary entrance at West Mather Drive, SAC/West entrance at Old Placerville Road, Military Family Housing entrance at Excelsior Road, and the East entrance at Douglas Gate Road (Fig. 1.3). Figures 1.1, 1.2, and 1.3 show regional, locale, and installation maps respectively for the base. The base is situated on 5,715 acres and is directly adjacent to the community of Rancho Cordova.

Much of the area to the north and northwest of the base is urbanized. Some vacant parcels are scattered through the area, including a few large areas of undeveloped land. To the northeast and southeast of the base, most of the area is low-density development, with some commercial and industrial activity along Folsom Boulevard and Sunrise Boulevard. South of the base, land use is primarily low density agricultural/residential.

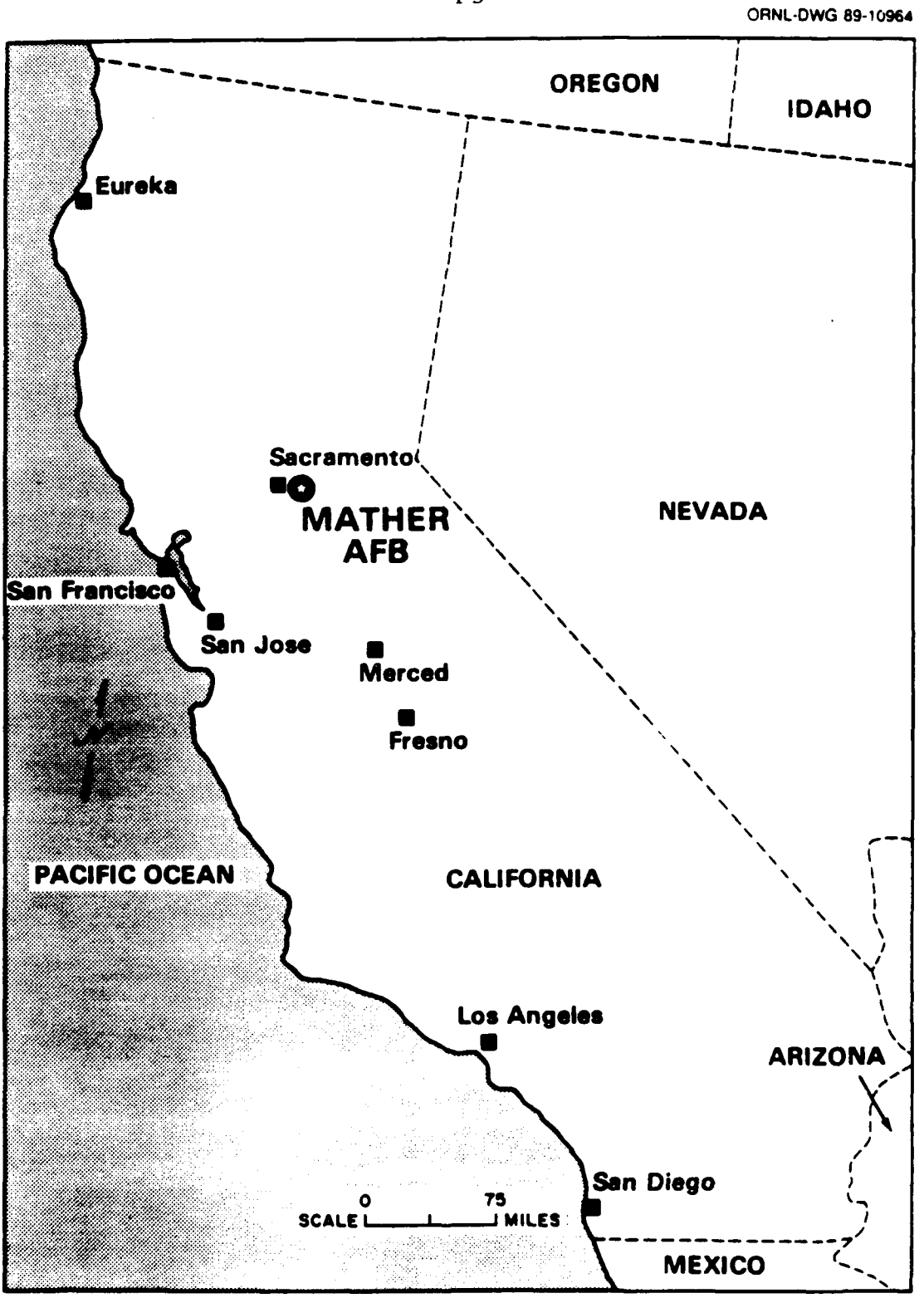

Fig. 1.1. Regional map of Mather Air Force Base.

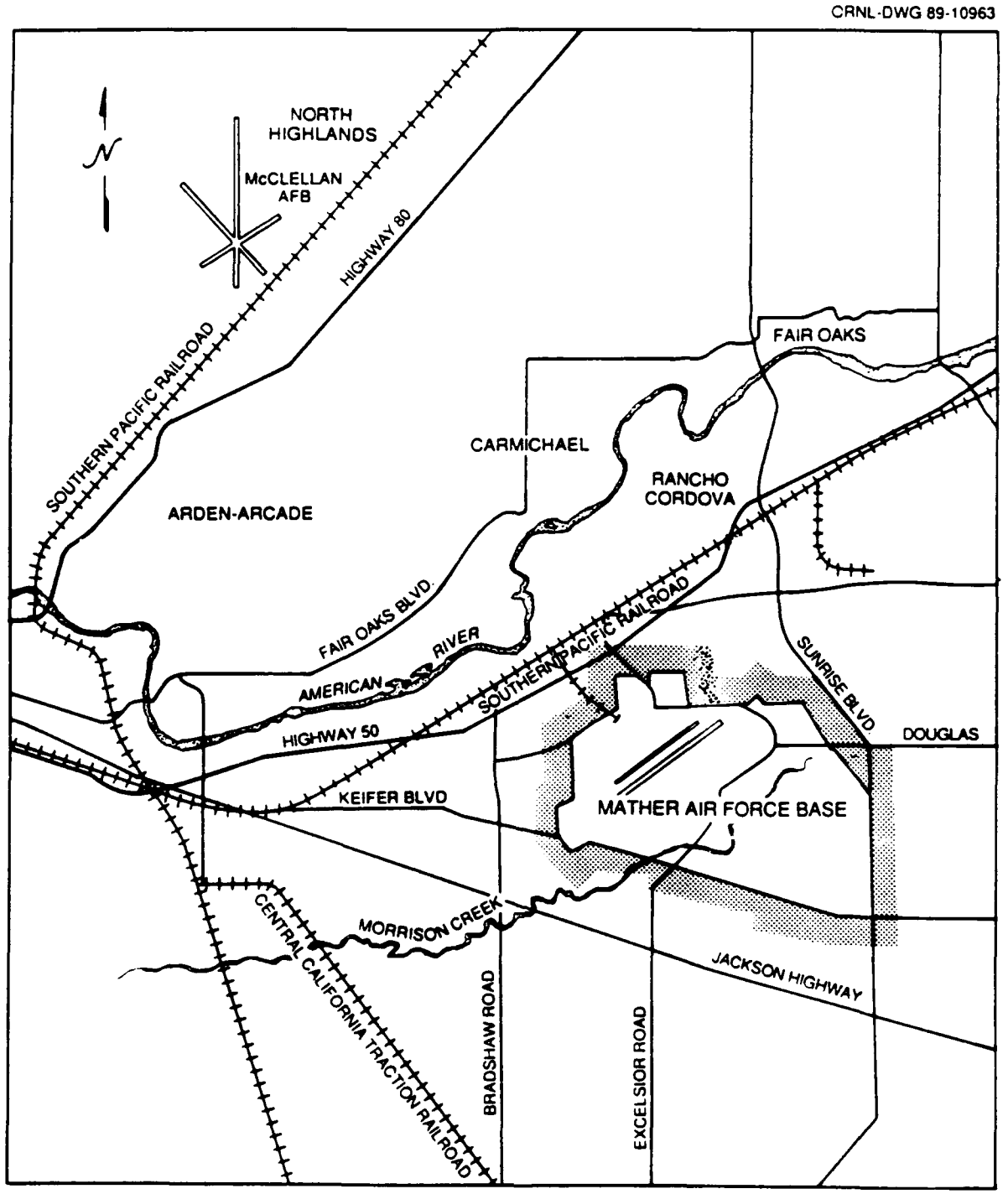

Fig. 1.2. Locale map of Mather Air Force Base.

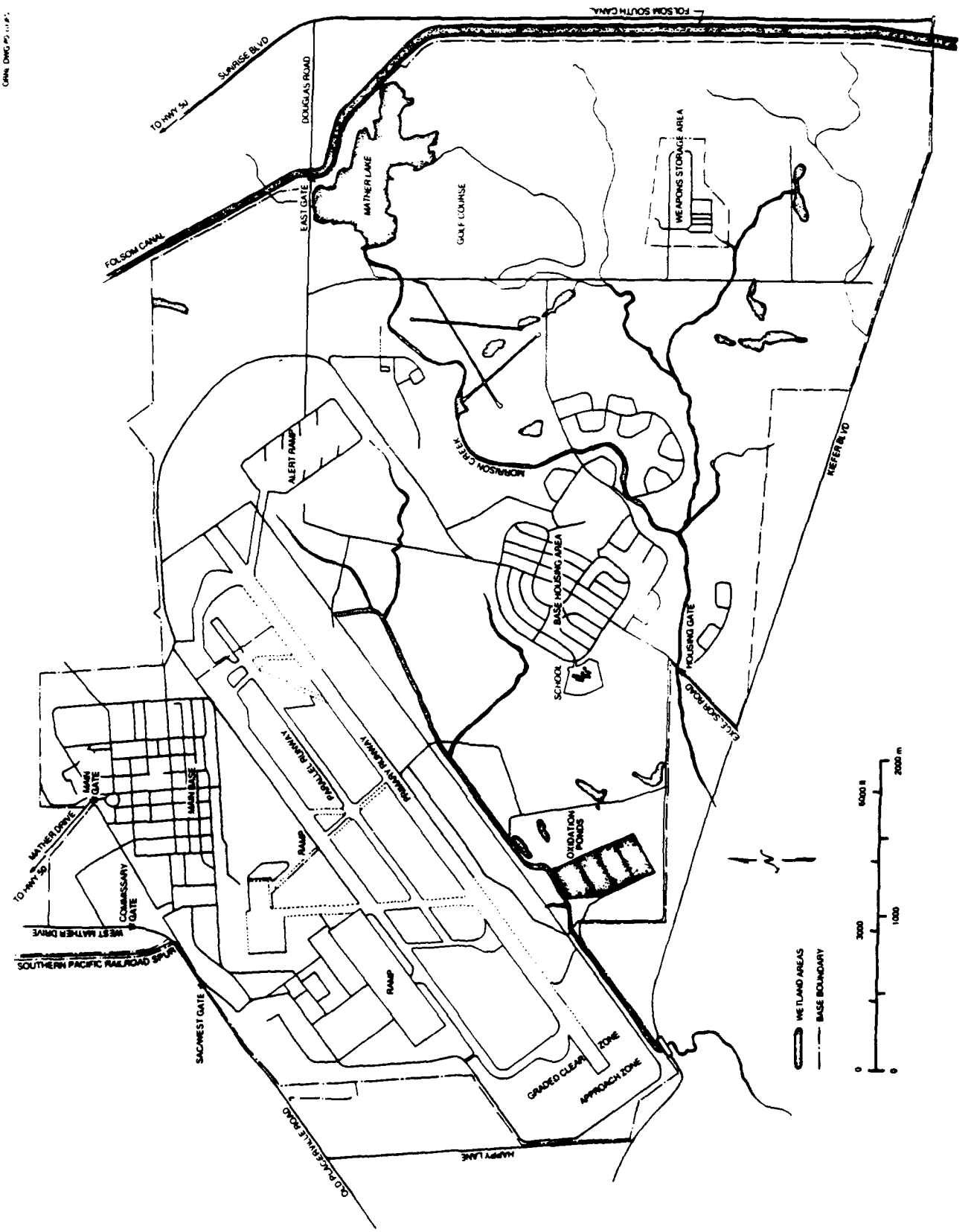

Fig. 1.3 Installation map of Mather Air Force Base.

As an Air Training Command (ATC) installation, the base has as its primary mission to qualify non-rated officers as navigators and to provide the navigator with the technical training experience, guidance, and motivation required to operate the advanced navigation, bombing, missile, and electronic warfare systems used by the United States Armed Forces. The host unit at Mather is the 323rd FTW of the ATC; the major tenants are the 320th Bombardment Wing (BMW) of the Strategic Air Command (SAC), and the 940th Air Refueling Group (ARG) of the Air Force Reserve (AFRES). The following smaller units are also tenants at the base:

- Detachment 7, 24th Weather Squadron;
- 2034th Communications Squadron;
- 3506th USAF Recruiting Group;
- Detachment 515, 3751st Field Training Squadron;
- Air Force Office of Special Investigation, Detachment 1904;
- Detachment 3, 3314th Management Engineering Squadron;
- Detachment 448, Area Audit Office;
- USAF Civil Air Patrol Pacific Liaison Region;
- Army Aviation Support Facility;
- USAF Judiciary Area Defense Counsel;
- Federal Aviation Administration;
- Air Force Commissary Services; and
- Army and Air Force Exchange Service.

In addition, Mather Hospital is located on base, and Mather AFB is the DOD executive manager for Air Force, Navy, and Marine Corps basic navigation training.

1.3 SCOPING PROCESS AND PLANNING ANALYSIS

1.3.1 Issues/Scope of the EIS

This is an implementation EIS designed to help the Air Force intelligently cease operations at Mather AFB. It analyzes the local environmental effects caused by the closure and the measures necessary to implement the closure, and it develops appropriate mitigation measures related to closure. The action addressed in this EIS begins with packing and dismantling of supplies and equipment at Mather and ends with arrival of equipment, supplies, and personnel at Beale AFB. Only those personnel and equipment associated with the 323rd FTW will be moved to Beale AFB. The 320th BMW is scheduled to be withdrawn from Mather AFB by October 1, 1989, regardless of base closure activities. The 940th ARG will either move to McClellan AFB or remain in place if the base is reused as a civilian airport. Potential effects from these latter two actions will be addressed in separate documents (see Sect 1.3.2).

The Notice of Intent (NOI) to prepare an EIS and hold a scoping meeting for closure of Mather AFB was published in the *Fed. Reg.* on February 8, 1989. The public

scoping meeting for the closure and reuse of Mather AFB was held in Rancho Cordova, California, on February 27, 1989. It was attended by approximately 250 interested members of the public, concerned agencies, and news media representatives. A total of 148 comments (verbal and written) were received in response to the NOI.

The scope of the issues to be addressed was identified from these comments, and the following issues related to the proposed action were identified for analysis:

- noise,
- energy use,
- air quality,
- solid and liquid waste disposal [only those related to closure action (see Sect. 1.3.3)],
- transportation,
- land use,
- ecology, and
- socioeconomics [only those socioeconomic impacts interrelated to the physical and natural environment are evaluated (see Sect 1.3.3)],

1.3.2 Related Environmental Studies

Several related environmental studies are planned or are under way:

Environmental assessment (EA) for B-52 removal from Mather. The removal of the 320th Bombardment Wing from the base will occur independent of the base closure action and will be the subject of an EA. This closure EIS incorporates by reference the key aspects of the EA, as appropriate for the consideration of cumulative impacts.

Beale AFB realignment EIS [See also: NOI (*Fed. Reg.*, Vol. 54, No. 25, Feb. 8, 1989, p. 6254)]. The beddown at Beale AFB of the 323rd FTW now located at Mather is the subject of a separate, concurrent EIS.

Mather AFB reuse EIS [See also: NOI (*Fed. Reg.*, Vol. 54, No. 25, Feb. 8, 1989, p. 6256)]. Many issues related to the reuse of the base facilities were identified during the scoping process. These issues will be addressed in a subsequent EIS, which will also address the future disposition of the 940th ARG.

Installation Restoration Program (IRP) studies. Environmental studies are under way at Mather AFB in support of the USAF IRP directed at cleanup of inactive hazardous waste sites. Activities to date have been primarily concerned with monitoring activities, identifying sites for cleanup, and removal of underground storage tanks. The next major phase is a Remedial Investigation/Feasibility Study (RI/FS) that will further characterize sites for possible cleanup and will develop and recommend alternative ways of cleanup. At the appropriate time, the RI/FS activities will be accompanied by an environmental impact analysis, in which public participation will be a key component.

1.3.3 Issues Beyond the Scope of the EIS

Since the IRP is being conducted independent of this action, potential effects of cleanup of the hazardous waste sites at Mather AFB are beyond the scope of this EIS and are addressed only to the extent that they are interrelated to closure actions and effects. Potential socioeconomic impacts are evaluated to the extent that they are interrelated to the physical and natural environment (40 CFR 1508.14). Potential impacts from loss of revenue to communities and loss of government services to retirees are being addressed through local commissions that are federally funded and which involve USAF representatives. In conjunction with activities of the DOD Office of Economic Adjustment, these actions are under way and are directed at minimizing potential adverse economic effects to the community from base closure.

1.4 RELEVANT FEDERAL, STATE, AND LOCAL STATUTES, REGULATIONS, OR GUIDELINES

Remedial cleanup actions are required at sites with releases or threats of releases of hazardous substances. The Comprehensive Environmental Response, Compensation, and Liability Act [(CERCLA) 42 U.S.C. 9601 et seq.] requires specific cleanup actions. Typically, these will be sites where soil and groundwater have been contaminated by former disposal practices and are being cleaned up under the IRP. Mather AFB is on the Environmental Protection Agency's National Priority List for priority cleanup. CERCLA Sect. 120(h) requires that cleanup take place before transferring any real property, unless the property is transferred to a party who is aware of their potential responsibility for any remaining contamination.

Hazardous waste treatment, storage, or disposal (TSD) facilities require formal closure procedures and written approval from the Environmental Protection Agency (EPA) prior to abandoning any TSD site [Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6921-6939b]. Federal regulations at 40 CFR 264.110 relating to permitted status, and Sect. 265.110 relating to interim status require specific planning that should aid closing installations in predicting time and cost of RCRA-required closure actions. Mather AFB has submitted to the EPA Part B of the RCRA permit application which contains closure plans for all TSD units on base. The major TSD unit is the Hazardous Waste Conforming Storage Facility which will be closed in accordance with all applicable regulations.

Underground storage tanks (USTs) containing petroleum or hazardous substances are covered by RCRA Subtitle I (42 U.S.C. 6991-69911). Regulatory procedures are similar to those outlined for closing TSD facilities and are set forth at 40 CFR 280.71.

Under the Clean Air Act (42 U.S.C. 7401 et seq.), states are allowed to use a program of air emission credits and banking as an air pollution abatement tool. Emission credits identified and banked can have an economic benefit for other military installations in the area or can be sold to private industrial concerns. No formal emissions banking

program is in place in Sacramento County (Gary Glissmeyer, Sacramento County Air Pollution Control District, personal communication to D. B. Hunsaker, Jr., February 28, 1989). Thus, the U.S. Air Force would not be expected to receive any credits from cessation of emissions at Mather AFB.

If any hazardous materials or substances are transported off base during closure, the transportation would be done in accordance with 49 CFR 171-173 (California has incorporated by reference 49 CFR 107, 171-179 and 393.86). It is likely that hazardous materials at Mather AFB would be transported to McClellan AFB for disposition through the Defense Reutilization and Marketing Office (DRMO). Key aspects of these regulations are proper labelling and packaging of the materials being transported. Transport of substances representing inhalation hazards and in quantities exceeding 118.5 gal requires written notification to the California Highway Patrol (D. Munier, California Highway Patrol, Sacramento, California. Personal communication with J. T. Ensminger, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 29, 1989).

Closure will also require terminating permits for air emissions and wastewater discharge. This can be done by not renewing them or by direct notification to the agency of permit cancellation. Appendix E lists current permits at Mather AFB.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 THE PROPOSED ACTION

The proposed action is to (1) relocate the 323rd Flying Training Wing (FTW) to Beale AFB, California; (2) deactivate all remaining Mather AFB support units as appropriate; and (3) dispose of base property in accordance with the provisions of public law, federal property disposal regulations, and Executive Order 12512.

Detailed plans for closing Mather AFB are in preparation and thus are not available for evaluation in this document. Consequently, the following conceptual description of the closure process was developed to permit an analysis of potential environmental impacts associated with carrying out closure of Mather AFB.

For purposes of this document, closure is defined as the withdrawal of personnel and equipment associated with the 323rd FTW from Mather AFB and the transportation of same to Beale AFB, California, which is located about 60 road miles north of Mather AFB. The 323rd FTW consists of about 3500 military personnel, 14 T-43 aircraft, 17 T-37 aircraft, associated training equipment, and support equipment, supplies, facilities, and personnel. Only the equipment and personnel associated with the 323rd FTW (less base operating support) would move to Beale AFB. It is assumed for this EIS that the 940th ARG is placed on "cold standby" and is neither active at Mather AFB nor is it removed from Mather AFB as a part of closure. Potential effects associated with the 940th ARG will be addressed in the reuse EIS for Mather AFB. All other Mather AFB support units would be deactivated. Associated property (supplies and equipment) for deactivated units would be transported to and disposed of at McClellan AFB, which is located about 10 road miles to the northwest of Mather AFB and which is the site of the DRMO for Mather AFB. The action evaluated in this document thus begins with the packing of supplies and equipment at Mather AFB and ends with the arrival of the personnel and equipment at Beale AFB. Movement of personnel and equipment could be complete as early as July 30, 1993, but may extend into 1995. Withdrawal of personnel and equipment from Mather AFB is estimated to take about 9 months.

Closure of Mather AFB is assumed to consist of placing the installation in cold shutdown. All facilities and structures would be left "as is," unless stated otherwise by environmental permits (see Sect. 1.4). No construction or demolition activities are planned. All utilities and infrastructure would be placed on standby except for the minimum needed to support ongoing hazardous waste cleanup efforts and to support the possible continued use of the T-45 flight simulator (see Sect. 2.2). Sewer connections to the Sacramento County regional treatment facility would be capped. All groundwater production wells would cease operation unless needed for monitoring purposes for the hazardous waste cleanup activities. Pipelines into the base for delivery of JP-4 jet fuel would be emptied

and capped. All gates would be closed and locked, and the base would be patrolled by a security force. No information is currently available as to how long the base would remain in this condition. The duration and timing of hazardous waste cleanup operations may affect the timing of the reuse and may also affect the areas available for reuse.

The T-37 and T-43 aircraft belonging to the 323rd FTW would be flown to Beale AFB. Supplies, equipment, and personal property to be moved to Beale AFB would be packed and shipped by U.S. Air Force teams and/or commercial carriers. Supplies and equipment not moved to Beale AFB would be disposed of as excess property through the DRMO at McClellan AFB. Based on the relatively short distances involved to Beale AFB and to McClellan AFB and the time allowed for the move (9 months) it can be reasonably assumed that most of the move would be accomplished through the use of military and/or commercial tractor trailer rigs.

Substances and materials with the potential to adversely affect the environment would be removed from Mather AFB during the closure process, including the following: hazardous materials in storage (e.g., flammable/combustible liquids, acids and other corrosive substances, compressed gases, lubricating oils, hydraulic fluids, solvents, paint thinners, etc.); hazardous wastes; toxic substances (e.g., electrical equipment containing polychlorinated biphenyls); pesticides, herbicides, fungicides and rodenticides; pathological wastes; and vehicle and aircraft fuels. All wastes would be disposed of in accordance with current permits and approved procedures. All materials for disposal as excess property would be transported to McClellan AFB.

Plans for the closure of Mather AFB and the move of the 323rd FTW to Beale AFB have not been finalized. Therefore, information on procedures, timing, and transportation modes are not available for evaluation. Consequently, conservative assumptions are used throughout this document to analyze potential impacts of implementing the proposed action.

Using the assumptions given in Appendix H, it is assumed that a total of about 10,000 tons of personal belongings and equipment would be moved from Mather AFB to Beale AFB, which would require about 1130 truck loads, or about 2260 truck trips (assuming each truck travels to Beale AFB fully loaded and returns to Mather AFB empty). Transportation of personal vehicles is estimated to result in about 1,980 car trips, and transportation of personnel without personal vehicles would require about 61 bus trips. Each of the 318 vehicles of the 323rd FTW is assumed to be driven individually from Mather AFB to Beale AFB. Total vehicle activity associated with movement of the 323rd FTW is thus estimated at 4619 vehicle trips. If this activity occurs over a nine-month period (274 days), then the average transportation activity would be about 17 trips/day. Movement of supplies and equipment to the DRMO at McClellan AFB is estimated to require about 33 truck loads, or 66 truck trips. This would result in an average daily traffic load of 0.24 trips/day.

2.2 ALTERNATIVES

The provisions of the Base Closure and Realignment Act and the recommendations of the Defense Secretary's Commission preclude any alternative action to closure of the base. Accordingly, the only alternative analysis to be included in the environmental impact analysis process is that associated with clearly defined alternative ways to actually carry out the closure. For closure of Mather AFB, no alternative bases to Beale AFB for relocation of the 323rd FTW were identified for analysis. Similarly, no alternatives to deactivating remaining active support units at Mather AFB were identified. The CEQ regulations implementing the procedural provisions of NEPA require that the "no action" alternative be discussed in EISs.

For the Mather AFB closure, an alternative within the proposed action is partial closure. Partial closure involves closing the entire base except for the Electronic Warfare Officer Training facility. The USAF has determined that moving the existing flight training simulator within this facility at Mather AFB is not viable given the age of the computer equipment and the limited availability of replacement parts. Consequently, a new system will be purchased and installed at Beale AFB. If the new equipment is not installed by the anticipated date for completing the move to Beale AFB, then the existing training facilities at Mather would continue to be used. Approximately one busload of students would make a round trip from Beale AFB daily for classroom training. The minimum base operating support needed at Mather to keep the training facility operational would be maintained. Once the new equipment is installed at Beale AFB, then the remainder of the base would be closed.

As planning for carrying out closure continues, alternative means of implementing closure may be identified for analysis in a later version of this EIS. Alternatives could include the timing of the closure action; the transportation mode used to move personnel, equipment, and supplies; and the transportation routes and distances. The potential environmental impacts of any such alternatives that are identified will be evaluated.

2.3 COMPARISON OF PROPOSED AND ALTERNATIVE ACTIONS

The short-term impacts of the proposed action implementation are anticipated to result from (1) energy use (and associated air pollutant emissions) from transporting personnel and equipment; (2) generation of hazardous and nonhazardous wastes due to the cessation of operations and the consolidation of materials and equipment in preparation for transportation to Beale AFB and/or McClellan AFB; and (3) noise impacts from transporting personnel and equipment from Mather AFB. Removing people and equipment from the base may cause some minor, temporary disruptions to ongoing activities in support of cleanup of past hazardous waste sites, but the potential for interference is low given the locations of the sites in light of the areas where most of the packing and moving activities would occur. Impacts to water quality, ecological resources, and historical and cultural resources are expected to be minor.

The long-term residual impacts on the biophysical environment from the cessation of base operations are expected to be primarily beneficial through the elimination of air emissions, wastewater effluents, and wastes (solid and liquid, hazardous and nonhazardous). Socioeconomic impacts are expected to consist of (1) a loss of revenue to county-operated wastewater treatment and landfill services because of the elimination of Mather AFB wastes and (2) improvements in traffic flow on local roads in the vicinity of Mather AFB during peak commute hours due to the absence of Mather AFB commuters. Land use impacts in the surrounding community could result since the current restrictions on residential development based on noise and safety considerations would be eliminated. It is recommended that any changes in zoning and land use be done after specific reuse options for Mather AFB have been identified. Secondary impacts due to increased development could result, with concomitant impacts to air quality, water resources, and transportation systems. The occurrence of these effects would be subject to the actions of local governments that in turn must comply with the California Environmental Quality Act. For these reasons, those secondary potential land use impacts are described but not quantified in detail in this EIS. Lastly, closure of Mather AFB would have long-term potentially beneficial impacts due to the cessation of energy use on the base, which in turn would be at least partially offset by an increase in energy use at Beale AFB. The closure is not expected to result in adverse impacts to the ongoing activities directed at the cleanup of past hazardous waste sites. A number of the beneficial biophysical impacts reflect the loss of emissions, effluents, and wastes that would, to some extent, be offset by increases in some of the same parameters at Beale AFB. The net effect to the region (cumulative impacts) is expected to be small.

One important and potentially adverse residual impact stemming from base closure is in the area of ecology. Closure of the base could result in the loss of managed habitat for the burrowing owl (a state species of concern), a loss of managed lands containing vernal pools, and a cessation of the maintenance of the level of Mather Lake (which could in turn affect the nature and extent of biota in the lake).

Partial closure would result in generally the same potential effects as identified for complete closure, in addition to the minor effects from energy consumption to transport students daily from Beale AFB to Mather AFB and back, effects from energy consumption on base to conduct the training (also expected to be minor), and effects from minor quantities of solid, nonhazardous wastes generated by the training activities. Most of these impacts represent a slight lessening of the beneficial biophysical impacts expected from cessation of base operations.

No action would result in continued operation of Mather AFB and thus would result in no change from the current environmental impacts.

2.4 MITIGATION

The following mitigation measures could reduce the potential for adverse environmental impacts from the proposed action:

- Continue U.S. Air Force pumping of water into Mather Lake to maintain its current level until this activity could be managed by the appropriate state or local agency. This would maintain its value as a recreational resource and avoid changes to lake biota caused by fluctuating lake levels that occur in the absence of pumping.
- Conduct all moving activities during daylight hours (to the extent practicable) to minimize noise impacts in the Mather AFB vicinity and along transportation corridors.
- Carry out closure over at least a 9-month period, as proposed, to minimize the potential for short-term adverse impacts on transportation systems and corridors.

In addition to the above, the vernal pool areas and burrowing owl habitat could be identified, mapped, and characterized to indicate areas of possible protection during the reuse of Mather AFB. Closure offers little potential (either during or after implementation) to adversely affect these resources. This ecological characterization work could be done in conjunction with the California Department of Fish and Game, which is a cooperating agency in the preparation of this EIS.

REFERENCES

Commission 1988. The Defense Secretary's Commission on Base Realignment and Closure. *Base Realignments and Closures: Report of the Defense Secretary's Commission.* Washington, D.C. December 1988.

3. DESCRIPTION OF EXISTING CONDITIONS

3.1 LAND USE

Airfields, military and civilian, attract activity in their environs. Sizable new cities may grow up near an airfield or existing cities may grow outward toward an airfield. This encroachment hampers the ability of airfields to support flight operations. In some cases, sufficient adverse reactions against operations have arisen to contribute to the eventual elimination of flying.

Recognizing the critical nature of urban encroachment throughout the United States, the USAF developed the Air Installation Compatible Use Zone (AICUZ) concept. The purpose of AICUZ is to delineate land use districts and establish guidelines for compatible land use within areas impacted by aircraft operations. Airfield environs planning is concerned with three primary determinants: (1) accident potential to land users; (2) aircraft noise; and (3) hazardous operations from land use (height, obstructions, etc.).

3.1.1 Accident Potential

To evaluate accident potential, the USAF has identified three types of areas characteristic of airfields. At both ends of the Mather AFB runways, expanded Clear Zones (CZs) and Accident Potential Zones (APZs) have been designated. Within the CZ, the overall risk is so high that necessary land use restrictions would prohibit reasonable economic use of the land. At Mather AFB, the Air Force has acquired the necessary real property interests in this area to prevent incompatible land uses. APZ I is less critical than the CZ but still has a significant risk factor. This area varies from 3,000 to 4,000 ft wide (depending on the runway) and is 5,000 ft long, and has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land. APZ II is less critical than APZ I but still has some risk. APZ II also varies from 3,000 to 4,000 ft wide, and is 7,000 ft long. The cumulative length of the CZ, APZ I, and APZ II extends to 15,000 ft from the runway threshold. At Mather AFB, all of the CZ is located on base. Most of the APZ I areas are outside of the base, as are all of the APZ II areas.

3.1.2 Noise

Environmental noise levels resulting from aircraft operations are described in terms of yearly average day/night sound level (Ldn y-avg) values. The Ldn is computed as the 24-hr average noise level, with a 10-dB penalty applied during 10 p.m. to 7 a.m. (Newman and Beattie 1985). The annual average Ldn (Ldn y-avg) provides the basis for the land-use-compatibility guidelines in the AICUZ Handbook (1984). In the remainder of this document, the term Ldn will be used, but will mean Ldn y-avg. Appendix A gives information on noise impact assessment, and Appendix B gives more information on the AICUZ program.

Ldn contours are generated using NOISEMAP, a computer program that combines operational data and standard aircraft source noise data corrected to local conditions. Data describing flight tracks, altitude profiles, power settings, flight path and profile utilization, and ground run-up information by type of aircraft are input to NOISEMAP. Appendix C gives more information on NOISEMAP.

Current flight operations at Mather AFB involve the 320th BMW, the 940th ARG, 323rd FTW, and transient military aircraft. However, by the time closure begins, the 320th BMW is not expected to be in operation at Mather AFB, and thus would not contribute to the noise footprint for the base. NOISEMAP was used to predict noise levels from expected future Mather AFB aircraft activity (current less the 320th BMW) for specified Ldn values. The NOISEMAP results consist of a map of noise contours, as is shown in Fig. 3.1. From the map of noise contours, areas within specific contours can be measured.

Current Air Force guidelines in the AICUZ program stipulate an Ldn value of 65 dB as the upper limit for residential development unless special noise insulation features are incorporated into buildings. The Department of Housing and Urban Development has adopted an Ldn value of 65 dB as the upper limit of acceptable noise for residential development. The Federal Aviation Administration uses an Ldn of 65 dB to define residential noise impact areas around airports, and the American National Standards Institute suggests a limit of 65 dB for land use planning with respect to noise. Thus, an Ldn value of 65 dB is a reasonable goal for minimizing annoyance and noise interference to the community from aircraft operation (see Appendix A for more details).

The area enclosed by the 65 dB contour, which is of principal interest, is about 25,000 acres. The majority of this area is off the base; however, most of it is sparsely populated. Table 3.1 summarizes the designations for each land use type and its compatible noise level. For the most part, the noise levels generated by Mather AFB operations are compatible or conditionally compatible with the surrounding environment, except for a small incompatible industrial area located to the northwest of the airfield. NOISEMAP results reflect only the contribution of aircraft noise to ambient background noise levels. In addition to aircraft noise, traffic noise and noise from other sources may make a significant contribution to, or even dominate, the noise levels at any specific location off base.

3.1.3 Height and Obstruction Criteria

In addition to accident potential and noise, the AICUZ plan also addresses height and obstruction criteria for areas in the vicinity of airfields. These criteria, established by the USAF and the Federal Aviation Administration, prohibit any land uses in the vicinity of airports and military airfields that are associated with the following activities: release into the air of any substances that would impair visibility or otherwise interfere with the operation of aircraft; production of illumination (either direct or reflected) that would

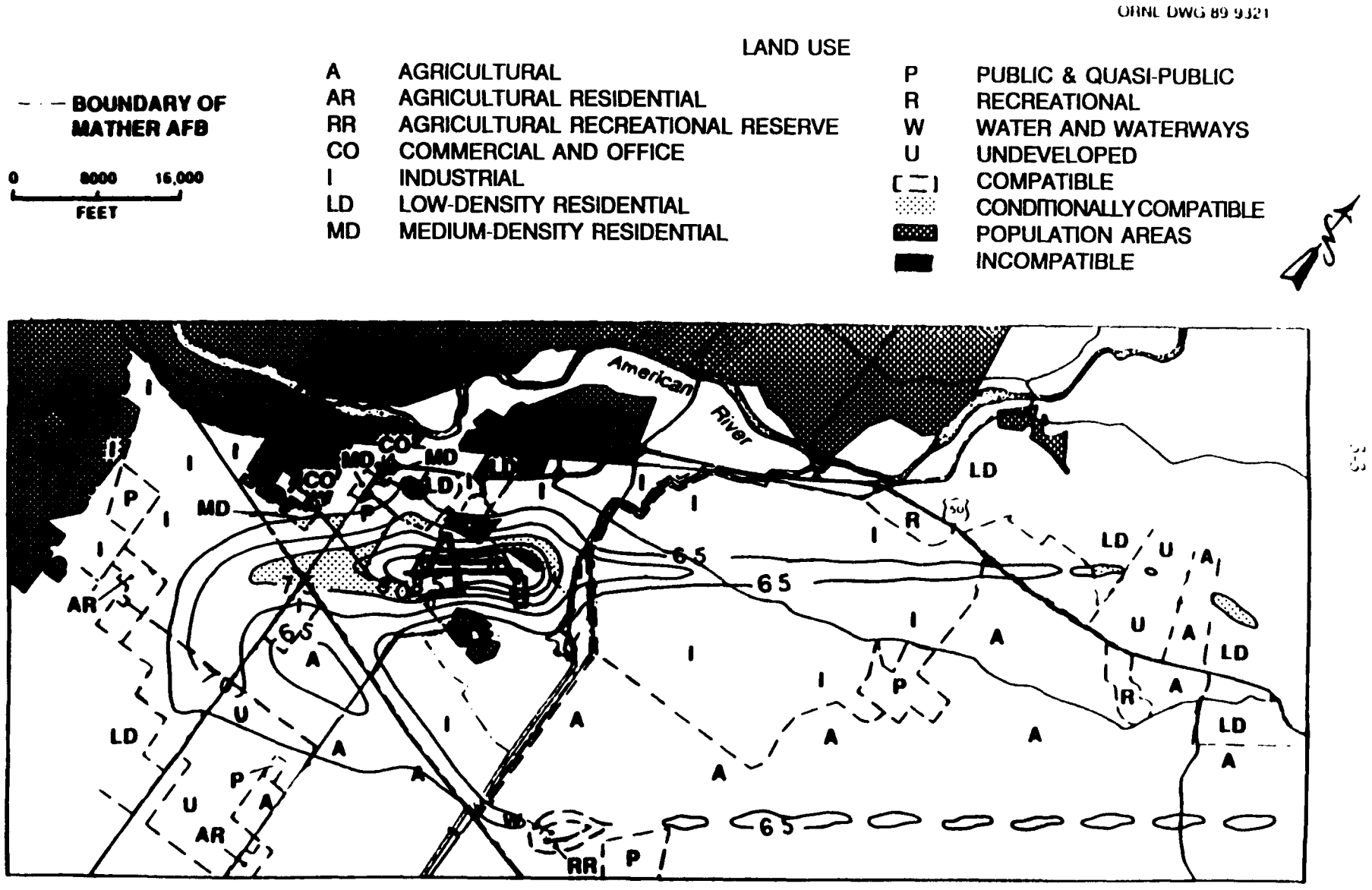

Fig. 3.1. Average day-night level (Ldn) noise contours for Mather AFB operations.

Table 3.1. Summary of land use designators and compatible noise levels for Mather AFB environs

Designator	Description	Range of day-night sound level (Ldn), dB		
		Compatible	Conditionally compatible[a]	Incompatible
A	Agricultural	No restriction		
AR	Agricultural residential	<65	65-75	>75
RR	Agricultural recreational reserve	<65	65-75	>75
CO	Commercial and offices	<70	70-80	>80
I	Industrial	<75	75-85	>85
LD	Low density residential	<65	65-75	>75
MD	Medium density residential	<65	65-75	>75
P	Public and open area	<75	--	>75
R	Recreational	<75	--	>75
W	Water and waterways	<75	--	>75

[a]With extra noise insulation.

interfere with pilot vision; production of electrical emissions that would interfere with aircraft communication and navigation systems; attraction of birds or waterfowl; or placement of any type of natural or man-made object in such a location and at such a height so as to interfere with approaches and departures of aircraft. These obstruction criteria have been adopted by the State of California and have been incorporated into the zoning laws of Sacramento County.

Mather AFB is in an area which has the potential for a suburban development. This characteristic presents a problem since one of the more common incompatible land uses near airfields is residential development. The Sacramento County zoning officials and planners are aware of the development problems associated with the AICUZ and have incorporated appropriate measures into the land use planning and zoning process.

3.1.4 Present and Future Land Use

Existing land uses around the base reflect the planning considerations and are generally as follows:

North and Northwest
This area has mostly single-family residential development, with major retail centers and other business uses centered along Folsom Boulevard and Mather Field Road. This area includes schools and outdoor public recreation facilities.

West and Southwest
This area is mostly open rural land with farms and grazing.

East and Northeast
This area is mostly industrial, with some commercial and agricultural areas.

South
This area is mostly agricultural, with little commercial and industrial activity.

Future development is likely to occur in the areas to the east, south, and southwest of the base. At present, these areas are mostly undeveloped and flight operations cause few complaints and pose little danger. Development in these areas would increase complaints and increase safety hazards, and almost certainly result in demands for restrictions on flight operations.

The "East Area Transportation Study," completed for the Sacramento County Board of Supervisors in September of 1984 (East Area Plan 1984), addressed a 95,000-acre area of eastern Sacramento County. This study recommends a number of alternatives for new and upgraded highways and interchanges. Highway proposals for agricultural and undeveloped lands adjacent to Mather and within affected outlying noise areas are included.

The "Comprehensive Land Use Plan" (CLUP) for Mather AFB (SACOG 1987) was adopted and included in the County's General Plan in September 1987. The CLUP provides direction for mitigating and prohibiting incompatible land uses and development within the base environs.

3.2 ENERGY USE

Operations at Mather AFB consume petroleum-based fuels for vehicles, equipment, and aircraft, natural gas for heating, and electricity.

JP-4, the most common aircraft jet fuel, is delivered to Mather AFB by pipeline to storage tanks with capacities of 826,000 and 427,000 gal. From this storage, the fuel is moved by underground pipeline to 16 50,000-gal underground tanks which fuel the hydrant aircraft fueling system used for the 320th BMW. For other aircraft, JP-4 is bottom-loaded into refueler trucks for flight line use. Diesel and gasoline are stored in two 25,000-gal and four 20,000-gal underground tanks. In addition, there are 24 underground tanks storing diesel, gasoline, or JP-4 for heating, power production, or equipment support that range in capacity from 200-8,000 gal. Mather AFB has an aggressive program to remove abandoned underground storage tanks. Twenty-seven of these tanks have been removed as part of an ongoing base program. This latter program will remain active as base closure allows more tanks to be taken out of service.

Quantities of fuel used during the period July 1-December 31, 1988, are as follows:

- JP-4: 20,154,723 gal (of which the 323rd FTW used about 22%);
- Gasoline (unleaded): 104,579 gal
- Diesel: 48,389 gal

Natural gas is supplied to Mather AFB by Pacific Gas and Electric. In 1987, a total of 247,225,000 ft^3 of natural gas was consumed at Mather AFB. About 40% of the total was used by the housing area, and the remainder by commercial and industrial activities.

Mather AFB receives its electricity from Sacramento Municipal Utilities District (SMUD). In CY 1988, the base used 64,058,000 kWh of electricity. In 1988, SMUD electricity sales totalled 8,761,756,000 kWh (EIA 1988).

3.3 CLIMATE AND AIR QUALITY

The climate in the Sacramento Valley portion of the Central Valley in California is characterized by dry, hot summers and moist, cool winters and is comparable to a Mediterranean to subtropical climate. Relative humidity ranges from 60 to 90% in winter and from 15 to 30% in summer. The amount of sunshine in January averages 44% (14 days) and increases gradually to more than 90% during June through August

(USAF 1988). In the winter (December, January, and February), over one-half of the total annual rainfall occurs on about ten days monthly. Excessive rainfall and damaging windstorms are rare in the Mather AFB vicinity (Base Plan 1988).

Air quality in the Sacramento region is classified as not meeting federal clean air standards for particulate matter, ozone, and carbon monoxide. Ambient levels of nitrogen dioxide and sulfur dioxide in the Sacramento area are below standards or cannot be classified due to a lack of data (40 CFR 81.305). Ozone is formed in the atmosphere through a series of reactions involving a number of chemicals including nitrogen oxides and hydrocarbons.

Estimated pollutant emissions from current base operations at Mather AFB are summarized in Table 3.2 and compared to estimated total emissions in Sacramento County. For the county, mobile sources comprise 65% of the hydrocarbon emissions, 96% of the carbon monoxide emissions, 91% of the nitrogen oxides emissions, 96% of the sulfur oxides emissions, and 5% of the particulate matter emissions. Hydrocarbon emissions from Mather AFB are the most significant in comparison to the county totals, but still only represent about 3% of total hydrocarbon emissions. For Mather AFB, mobile sources largely account for emission totals affecting the existing environment, contributing between 50% and 90+% of each of the five pollutant totals.

Emissions at Mather AFB originate from several major sources, including flight operations, nonflight but aircraft-related operations, and nonaircraft-related sources. Flight operations include resident as well as transient aircraft. Aircraft-related operations support operations and include engine run-ups for testing purposes, aerospace ground equipment operations, aircraft refueling operations, and the application of surface coatings, solvents, adhesives, and paint removers. Non-aircraft-related sources include government and privately owned vehicles, residences on base, and others. Carbon monoxide emissions emanate primarily from aircraft and private automobiles.

The aircraft-related (non-flight operations) emissions mentioned above are comparatively small with the exception of refueling operations. Most of the emissions from refueling operations (primarily hydrocarbons) are the result of JP-4 fuel evaporation. Emissions result from standing and working losses as well as from tank truck transfers and aircraft fueling (Sect. 3.2).

3.4 WATER RESOURCES

3.4.1 Surface Water

Surface-water hydrology at Mather AFB is dominated by Morrison Creek, a tributary of the Sacramento River. The creek cuts across the southeast portion of the base and receives runoff from Mather AFB (see Fig. 1.3). Mather Lake, located along the east boundary of the base, was created for recreational purposes by damming a small tributary of

Table 3.2. Estimated annual air pollutant emissions from current operations at Mather AFB and comparison to regional emissions[a]

Pollutant	Annual regional emissions, Sacramento County (tons)	Estimated annual pollutant emissions, Mather AFB[b]	
		Emissions (tons)	Percent of regional total
Carbon monoxide	200,750	2,060	1.0
Hydrocarbons	40,150	1,058	2.6
Nitrogen oxides	28,105	428	1.5
Sulfur oxides	1,934	28	1.4
Particulates	69,350	48	.1

[a]*Source*: Mather Air Force Base: Mather AFB Air Emissions Inventory, 1 August 1987–31 July, 1987. Sacramento County: Sacramento County Air Pollution Control District, 1983 Base Year Pollutant Emissions Inventory, Sacramento, California, December 24, 1986.

[b]For the period August 1, 1986 through July 31, 1987.

Morrison Creek. This lake receives and stores runoff from off-base via an aqueduct constructed over the Folsom South Canal, which is located along the east boundary of the base (Fig. 1.3).

Some floodplain areas (100-yr floodplain) are located on Mather AFB, primarily along Morrison Creek, along the small unnamed creek located to the south of the runways, miscellaneous drainage ditches, and Mather Lake (Fig. 1.3). Total floodplain acreage on Mather AFB is about 270 acres (USAF 1988b).

Principal sources of wastewater discharges at Mather AFB are metal cleaning rinse water, effluents from surface preparation and painting operations and aircraft washracks, vehicle and equipment washdown wastewaters, laboratory (photography, dental) effluents, and sanitary sewage from the main base, base housing and other areas.

Wastewater generated at Mather AFB is discharged to the Sacramento County regional sewer. The base has a contract with Sacramento County under which the county will accept 2 million gal of sewage per day. Flows in excess of the 2 million gal are stored on base and discharged during periods of low flow. A pump station on base pumps excess flow into one of four holding ponds with a total capacity of 83 acre-ft. Wastewater generated by Mather AFB is governed by the California Regional Water Quality Control Board (CRWQCB) Order No. 83-093 and the Sacramento Regional Sanitation District Sewer Use Permit #21. In 1988, the annual average of the daily average sewage flows from Mather AFB was 0.940 million gal; about 90% of the total represents sanitary sources, and the remainder is from industrial sources. The Mather AFB flow is less than 1% of current flows treated by the county. No National Pollutant Discharge Elimination System (NPDES) permits govern Mather AFB at this time. The Sacramento Regional Sanitation District requires semiannual sampling reports from the plating and cleaning effluents. The district conducts its own monitoring at the county sewage lift station for biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids, cyanide, and four heavy metals, and at the plating and cleaning shop discharge for cyanide and seven heavy metals.

Stormwater run-off at Mather AFB is discharged through drainage ditches into Morrison Creek at approximately the 7100 area (located north of the oxidation ponds shown in Fig. 1.3). The perimeter ditches have oil/water separators located at strategic points to catch and hold contaminants (CH$_2$M Hill 1982). No compliance monitoring is required for stormwater run-off.

3.4.2 Groundwater

Fresh groundwater occurs at Mather AFB and the surrounding area in a wide variety of geologic materials beneath the Sacramento Valley. Most of the groundwater available for development is stored and moves through sand or sand and gravel strata which were deposited in the past by streams flowing into and through the valley.

Groundwater flow in the Mather AFB area is influenced by water withdrawals caused by irrigation in the Elk Grove area located south and southwest of the base. Thus, the general direction of groundwater flow in the Mather AFB vicinity is thought to be from the northeast to the southwest. Precipitation recharges the formations in the Mather AFB area, either directly as rainfall or indirectly as snow melt.

Groundwater is discharged from the aquifer system primarily by pumpage. Some water is lost by evapotranspiration and by discharge to streams (CH_2M Hill 1982). Pumpage rates in the Sacramento area were about 8.1×10^{11} gal/yr for the Sacramento Valley Groundwater Reservoir (in 1964) and about 8.2×10^{29} gal/yr for the entire Sacramento Basin (Todd 1983).

Mather AFB draws its potable water supply from 11 wells (four in the main base area, six in the housing area, and one in the weapons storage area; see Fig. 1.3). The water supply wells range in depth from 200 to 585 ft and are of screened/gravel pack construction. Total groundwater production at Mather AFB from all wells is about 1.1×10^9 gal/yr, of which 60-70% is used by base housing. Contours for existing groundwater levels in wells in the Mather AFB vicinity show very little, if any, effect from Mather AFB well operations (U.S. Bureau of Reclamation 1988).

3.5 WASTE MANAGEMENT

Past waste disposal practices at Mather AFB have resulted in potential contamination being released to the environment. The IRP is designed to identify and evaluate suspected problems and control migration of hazardous contamination from suspect areas. The goal of the IRP Preliminary Assessment is to identify potential problems. At Mather AFB, this investigation resulted in the identification of 23 past disposal or spill sites possibly requiring study. Subsequent studies have identified eleven additional sites. The primary concern is trichloroethylene (TCE) contamination in the groundwater. Currently, actions are being considered to implement cleanup at Mather AFB.

One of the sites identified during the Preliminary Assessment, the air command and warning (AC&W) site, was judged by the EPA to result in sufficient potential for groundwater contamination that the site now appears on the National Priorities List for cleanup (*Fed. Reg.*, Vol. 54, No. 47, March 13, 1989, p. 10512). The AC&W site, which is located about 0.4 mi to the northeast of the base housing area, was used in the 1960s for disposal of waste solvents and oils into a 10-in diameter pipe. Because of its upgradient location, the site is a suspected source of the trichloroethylene detected periodically in the AC&W well and in some of the family housing wells located about 2400 ft away (USAF 1988a). The AC&W well (used for drinking water) was closed in 1979 due to trichloroethylene contamination.

In addition, underground storage tanks are being removed. As of February 1989, 23 of the 27 tanks had been removed, and only minor contamination was found in 21 of the 23

removals. The remaining two need to be investigated further before renovation can be completed.

The next major phase of the IRP is under way: preparing a workplan for the Remedial Investigation/Feasibility Study. The workplan will address planned actions such as drilling and sampling new wells, procedures used to provide protection to workers performing the investigation, and analysis methods for soil and water samples. The plan will consist of five volumes. Regulatory agencies must review and approve the plan before implementation can begin. The U.S. Air Force expects to begin implementation of the workplan in calendar year 1989.

Daily operations at Mather involve the use of JP-4 fuel, automobile fuel, solvents, lubricating fluids, and pesticides. Hazardous waste generated is put into drums and shipped offsite for disposal in accordance with permits. The federal legislation regulating management of hazardous waste is the Resource Conservation and Recovery Act (RCRA) of 1976, as amended in 1984 by the Hazardous and Solid Waste Amendments (HSWA). Mather AFB hazardous waste activities are regulated pursuant to RCRA and implementing regulations found in 40 CFR 240-399. California hazardous waste management regulations are found in Title 22, California Administrative Code, Section 3.0. Mather AFB has one hazardous waste treatment, storage, and disposal (TSD) facility operating under the interim status exemption in 40 CFR 270.70. Numerous hazardous waste generation and accumulation points are also present at Mather AFB.

Polychlorinated biphenyls (PCBs) are currently present at Mather AFB in electrical equipment. PCBs are covered by the Federal Toxic Substances Control Act (TSCA). The federal regulations that apply to the management of PCBs are contained in 40 CFR 761 (PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions). The California Administrative Code Title 22, Division 4, Section 66699 expands the federal definition of PCB contaminated material of 50 to 500,000 ppm to a more stringent 5 to 500,000 ppm PCB as a regulated hazardous waste. The base Electric Shop inspects 20 transformers and 35 capacitors which have been identified as probably containing PCBs based on a nameplate survey. Of these, seven transformers have been tested and contain between 6.8 and 29 ppm PCB which brings them under regulation by California Administrative Code. The remaining 13 transformers and 35 capacitors are assumed to be 50 to 100% PCB. In addition, four transformers, tested at 3.1 to 15 ppm PCB, have been placed in conforming storage at the TSD facility. These have been removed from service and are awaiting disposal. Additional transformers have been identified as unknown. The base Electrical Shop has been tasked with producing a base grid map identifying locations and data on all known and suspected PCB items; additional items identified from this map, or other known items, will become future PCB waste requiring disposal in that all PCB-containing equipment is planned to be removed from service.

Solid (nonhazardous) waste produced by Mather AFB is taken by a contractor to the Sacramento County landfill. Total solid waste production at the base for February 1988 through January 1989 was 5,621 tons, or 0.6% of the total landfill input for the period. The

county landfill has an area of 656 acres and has about 40 years of capacity remaining at current rate of fill (personal communication, L. W. Rickert, ORNL, with George Lynch, Solid Waste Division, Sacramento County, March 9, 1989).

Asbestos management at present consists of the removal of asbestos (when encountered during other construction activity) and storage near facility 4303 in the Main Base area (Fig. 1.3). All asbestos debris is crated/sealed, stored, and disposed of by contractors. An asbestos survey of each building has been accomplished and lists are maintained at bioenvironmental engineering and base civil engineering.

Demolition wastes at Mather AFB are disposed of both by contract and at a landfill located on base property. Demolition wastes disposed of by contractors are taken to a state-licensed county landfill. Pathological wastes generated by the base hospital are stored in the morgue for six months and are then disposed of at the Biohazardous Waste Contractor Facility in accordance with Hospital Regulation 160-42.

3.6 TRANSPORTATION

The proposed action will require transport of the personnel, aircraft, and equipment associated with the 323rd Flying Training Wing to Beale AFB, about 60 road miles from Mather AFB, and would be done by the USAF, commercial carriers, or both. This relocation is assumed (see Sect. 2.1 and App. H) to be accomplished by truck. Major transportation routes are shown in Fig. 3.2. Supplies and equipment not sent to Beale AFB would be disposed of through the DRMO located at McClellan AFB, which is about 10 road miles north of Mather AFB (Fig. 3.2).

The probable truck route from Mather AFB to Beale AFB consists of local roads (about 3 miles) to Highway 50 west, then highways (5 north, 70 north, and 65 north) to local roads south of Marysville; total highway distance is about 50 miles. From Route 65, local roads (about 6 miles) would be used to reach Beale AFB. The probable truck route from Mather AFB to McClellan AFB is Highway 50 west for about 5 miles and local roads north for about 6 miles. If hazardous materials are transported, the actual route would consist of roads designated for hazardous materials transport and thus may involve a longer distance [e.g., Highway 50 west to Highway 880 east, for a total distance of about 23 miles (about 12 additional miles)].

Major traffic carriers in the Mather AFB vicinity are Highway 50, Jackson Highway (State Route 16), Folsom Boulevard, Bradshaw Road, Mather Field Drive, and Coloma Road (East Area Plan 1984). Traffic loads for specific locations along these roads can be expressed in terms of volume-to-capacity (v/c) ratios that, in turn, are qualitatively associated with traffic condition descriptions to define a roadway level of service (LOS). LOS values—A, B, C, D, E, and F—range from "free-flowing" (A; v/c <0.61) conditions to "saturated flow" (F; v/c >1.00) conditions. Key locations near Mather AFB (see Figs. 1.2 and 1.3) and their peak-hour (afternoon/evening) traffic conditions are as follows:

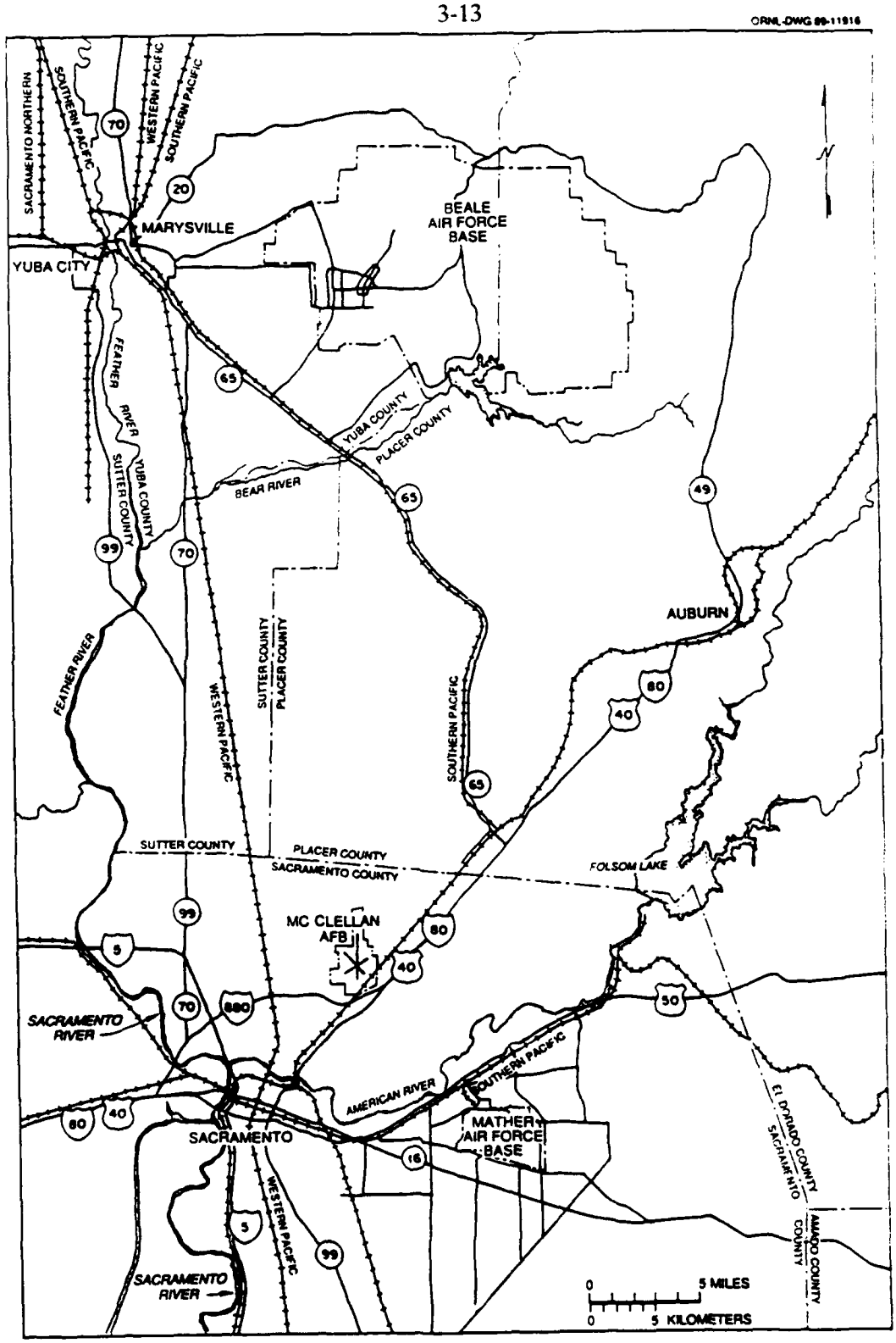

Fig. 3.2. Transportation routes from Mather AFB to Beale AFB and to McClellan AFB.

Location	*v/c ratio*	*LOS*
Old Placerville Road	0.55	A
Folsom Boulevard	0.97	E
Hwy. 50 west off-ramp	0.74	C
Hwy. 50 east off-ramp	0.77	C
Douglas Road	0.35	A

High traffic loads exist at Folsom Boulevard and also at the Highway 50 off ramps; commute traffic associated with Mather AFB contributes to these traffic levels.

In addition to v/c ratio and LOS, average daily traffic levels are also of interest. Traffic loading on Route 50 west to Route 5 ranges from about 130,000 to 140,000 vehicles per day on an annual average. At the junction with Route 5 the annual average volume increases to approximately 190,000 per day. The annual average daily traffic volume on Route 70 drops drastically as it leaves the Sacramento vicinity to approximately 10,000 at the junction with Route 99 in Sutter County. The proposed route would continue north on Route 70 into Yuba County. Traffic volumes again increase to about 20,000 to 25,000 daily average after joining with the 65 expressway. The daily average traffic volume increases to approximately 48,000 at the North Beale Road Interchange (California Department of Transportation, 1988).

3.7 ECOLOGY

3.7.1 Wetlands

The eastern part of Mather AFB is drained by small incised tributaries of Morrison Creek, an ephemeral stream that flows southwesterly across the base toward the Sacramento–San Joaquin River delta region. Mather Lake, a 64-acre recreational impoundment formed from Morrison Creek, is near the northeastern corner of the installation. The creek flows onto the base via an aqueduct over the concrete-lined Folsom-South Canal, which extends north-south along the eastern boundary of the base (Fig. 1.3). The Lake has a shallow, sloping edge reaching only 18 ft at maximum depths and contains about 300 acre-ft of water, replenished by rain and runoff water during the winter months. During the summer, with no year-round inflow, evaporation can reduce the water to about 100 acre-ft. However, about 300 acre-ft are pumped annually by the Air Force from the Folsom-South Canal to maintain an average lake level of about 200 acre-ft throughout the summer (Base Plan, 1988).

Several drainage ditches to collect storm and surface water runoff from the main base and industrial operations areas discharge into Morrison Creek. The West Ditch and that portion of Drainage Ditch No. 2 paralleling the runways through the central portion of the base provide about 4 of the total of 6 miles of riparian habitat on the base. In

addition, northern hardpan vernal pools are known to occur in the grassland at Mather AFB (U.S. Bureau of Reclamation 1988; R. L. Bittman, State of California Department of Fish and Game, personal communication to L. L. Sigal, ORNL, May 24, 1989). These pools develop in shallow basins that form in flat to hummocky terrain. An iron-silicate soil durapan underlies the pool basins and prevents water infiltration; the nearby level terrain inhibits surface runoff. Saturated soil conditions cause the water table to become exposed because it is "perched" on the durapan. Hence, surface water accumulates in the basins and forms a seasonal wetland. Vernal pools are important wetlands because of their current scarcity relative to historic extent. It is estimated that about 5% of the Central Valley's vernal pools are intact today (U.S. Bureau of Reclamation 1988). They support an ephemeral, often unique flora.

Much of Morrison Creek has been cleared of former riparian vegetation, and some of the vernal pool areas have been ditched or filled in. However, many of these actions took place in the past before the significance of vernal pools was understood, and the existing vegetation growing on the unimproved areas of Mather AFB is generally healthy, vigorous, and supporting the appropriate fauna (U.S. Air Force 1988a).

3.7.2 Vegetation

Mather AFB is located on approximately 5800 acres, of which 2760 acres are unimproved grasslands with few trees and little woody vegetation except along the creek beds. Historically, perennial bunch grass species dominated the area, but these have given way to a typical annual grassland community composed of wild oats, brome, fillarie, dandelion, and thistles. Coyote bush, thistle, and the grasses provide cover and food for pheasants, quail, and rabbits. Many species of trees, shrubs, ground cover, and grasses have been planted on 503 acres of improved grounds.

Mather Lake supports emergent species common in shallow lakes, such as bulrushes, spike rushes, cattails, and water primrose. Submerged species include pondweed, milfoil, coontail, and stonewort (Vanicek 1986). Vegetation along drainage and in seepage areas usually consists of kale, wild rice, and joint grass.

Vernal pools support an ephemeral flora dominated by terrestrial annual species with perennial and aquatic species, often contributing significant cover. A succession of conspicuous zonation patterns is formed throughout the spring as species bloom around the drying pool margins. A number of special-status plant species can occur in this specialized, relatively uncommon habitat. Five such plant species are identified with an asterisk in Appendix D. Their suspected occurrence at Mather AFB is based on species habitat requirements and distributions and the presence of suitable habitat on the base. Moreover, these plants are found in vernal pools near the base (R. L. Bittman, State of California Department of Fish and Game, Natural Diversity Data Base, personal communication to L. L. Sigal, ORNL, May 24, 1989).

3.7.3 Fauna

A fish and wildlife management program for Mather AFB was initiated in 1958. A cooperative agreement was established in 1964 among Mather AFB, the California Department of Fish and Game, and what is now the U.S. Fish and Wildlife Service. The 1985 to 1990 update of this program was signed in 1985 (Crowl 1985). Its purpose is the protection, development, and management of the fish and wildlife resources at Mather AFB. This report lists 20 mammal, 60 bird, 9 reptile, and 3 amphibian species for the base. Most of the predatory birds (raptors) are transient, rarely nesting on the base because of the limited number of trees. Raptors that are considered residents include barn, burrowing, short-eared, and horned owls. Game species include black-tailed jack rabbit, audubon cottontail, ring-necked pheasant (stocked), mourning dove, California quail, and some waterfowl.

Morrison Creek and Mather Lake provide important habitat for both fish and wildlife. The lake is a haven for various waterfowl, such as ducks, geese, cranes, and gulls but does not support large numbers for any length of time. However, several thousand coots are semipermanent residents, with the population size varying from month to month. Herons and other wading birds are attracted to the shallow shoreline with its large numbers of minnows and other small fish. The lake has been stocked with largemouth bass, bluegill, redear sunfish, and channel catfish by the California Department of Fish and Game (Vanicek 1986).

Hunting and fishing by permit is allowed for active duty and retired military, their dependents, and DOD civilians assigned/attached to Mather and McClellan AFBs.

Special-status wildlife species that may occur at Mather AFB are listed in Appendix D. Suspected occurrence of six of the species is based on the availability of suitable habitat on the base. Of particular interest are the burrowing owls that nest on the base. The Mather AFB Fish and Wildlife Management Plan (Crowl 1985) discusses protection and management measures for the owls. These measures include location and mapping, and habitat improvement [i.e., mowing to provide short grass (7 to 14 in.) and open areas].

3.7.4 Special-Status Plant and Wildlife Species

No federally listed plant or animal species is currently known to exist on Mather AFB (Letter from G. C. Kobetich, U.S. Fish and Wildlife Service, to L. L. Sigal, ORNL, April 18, 1989 [Appendix F]). However, a number of special-status plant and wildlife species are reported in the area of Mather AFB, including the threatened valley elderberry longhorn beetle and 15 candidate species for federal listing (Appendix D). All of the species are of special interest to the California Department of Fish and Game (D. E. Warenycia, State of California Department of Fish and Game, Nongame Heritage Program, personal communication to L. L. Sigal, ORNL, March 7, 1989 and May 23, 1989; R. L. Bittman, State of California Department of Fish and Game, Natural Diversity Data

Base, personal communication to L. L. Sigal, ORNL, May 24, 1989). Some of these species are naturally rare, such as those that occur in specialized habitats, e.g. vernal pools. Others were historically widespread in the Central Valley of California, but are rare today because of habitat reductions due to land conversion for agricultural and urban uses.

In the absence of a systematic survey of Mather AFB, the possible occurrence and distribution of these plants and animals on the base are unknown.

3.8 SOCIOECONOMICS

The Sacramento Metropolitan Statistical Area (MSA) consists of Yolo, Placer, Sacramento, and El Dorado counties. Population statistics for the other areas in the MSA also show significant growth rates. The 1985 population (and growth rate from 1980 figures) is as follows: Yolo County, 129,298 (14%); Placer County, 135,965 (15.9%); El Dorado County, 100,515 (17.1%); Sacramento (city and county), 878,710 (12.1%).

The diversified nature of the local economy has contributed to the current economic health of the Sacramento County area. More than 40% of all jobs are held by trade and services workers, and government provides another 33%. Food processing is the most important manufacturing industry, and the ready availability of major transportation facilities enhances such commercial activity. Agriculturally, area land is predominantly used for field crops; but pears, grapes, and tomatoes are the most commercially valuable crops.

Recreational opportunities on Mather AFB include Mather Lake, a golf course, the Mather Rod and Gun Club, the Mather Circle M Riding Club, hunting, picnicking, off-road vehicle and hiking trails, and Boy and Girl Scout troop activities. These recreational opportunities are made available to the public to the greatest extent allowed by military, environmental, and safety concerns. Off-base recreation includes the American River Parkway, water sports at Nimbus Lake and Folsom Lake, ski resorts within 100 miles of the base, and many opportunities for photography enthusiasts.

3.9 Historic & Arch

There is no evidence of any historic or prehistoric archeological sites at Mather AFB (McIvers 1985). No further information on these resources was available from the California State Historic Preservation Officer (Appendix F).

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4. ENVIRONMENTAL CONSEQUENCES

Section 4.1 addresses potential short-term effects from withdrawing people, equipment, and supplies from Mather AFB and transporting them to either Beale AFB or McClellan AFB. People, equipment, and supplies associated with the 323rd FTW (less base operating support) would be moved to Beale AFB, whereas materials, supplies, and equipment not associated with the 323rd FTW would be transported to McClellan AFB for disposal through the Defense Reutilization and Marketing Office (DRMO). Section 4.2 addresses the potential long-term effects from cessation of operations at Mather AFB. The final disposition of the 940th ARG has not been determined and will be addressed in the EIS addressing reuse of Mather AFB. For the purposes of this assessment, personnel and equipment associated with the 940th ARG are assumed to be on hold (i.e., the 940th ARG is neither deactivated nor moved).

Impact analyses in this section focus on the assumed closure scenario as defined in Sect. 2.1. As discussed in Sect. 2.2, the only reasonable alternative to full closure is partial closure, in which a portion of the base would remain open to allow student training on the Electronic Warfare Officer Training Facility. Potential impacts from partial closure would be similar to those from full closure except for a small reduction in equipment and supplies to be moved to Beale AFB, energy use, and air pollution stemming from 1 round trip bus trip/day from Beale AFB to Mather AFB (each of which is negligible), and minor amounts of solid waste and wastewater from the classroom training activities. For all practical purposes potential impacts from partial closure (the only reasonable alternative identified) are sufficiently similar such that a separate impact analysis for partial closure is not warranted. Potential impacts from no action would reflect the existing conditions summarized in Sect. 3, and thus are not addressed in this section.

4.1 IMPLEMENTATION

4.1.1 Transportation

The proposed action would result in additional vehicle traffic (usually expressed as average daily traffic, which is the average number of vehicles passing a given point per day). Average daily traffic loads, assuming all vehicle trips are spread uniformly over the 9-month closure period, would be about 17 for the move from Mather AFB to Beale AFB, and about 0.24 for the move from Mather AFB to McClellan AFB. The traffic from the trips to Beale AFB and to McClellan AFB would be less than 1% of average daily traffic for key intersections located along the routes (Sect. 3.6), assuming that the moving activities are spread out over 9 months. In the event that the truck shipments to Beale AFB would need to be completed in a shorter time, the average daily traffic from the activity would increase, but is likely to remain insignificant. For example, if all truck trips to Beale AFB were

accomplished in two weeks, the incremental traffic loading would still be about 1% of the current levels at key intersections. All trips to Beale AFB would be mainly on interstate highways or U.S. highways (Sect. 3.6). Movement of equipment and supplies to McClellan AFB is likewise expected to produce only minimal impacts on transportation systems. Although the additional traffic could, at some locations, contribute to existing congestion (Sect. 3.6), the potential effects are expected to be temporary and minimal. The timing and routes of the transportation activities will be adjusted to minimize interaction with congested areas at key commute times.

4.1.2 Energy Use

The principal energy use resulting from implementation of the planned action would be diesel fuel for transport vehicles. The average fuel mileage of Air Force trucks of the class that would be used in such a move is 10.5 mpg (ORNL 1985). However, all other armed services trucks typically demonstrate substantially lower mileage. As a conservative assumption, the lowest mileage rating of the four branches of the military for the 24,000 lb class of truck (5.5 mpg) is used (ORNL 1985).

As estimated (Appendix H), approximately 2,260 truck trips would be required to move the 323rd FTW operations to Beale AFB. At about 60 miles per truck trip (one way) the total truck distance travelled for the move would be about 135,600 miles (Sect. 2.1). An average fuel mileage rate of 5.5 mpg would indicate that the move of materials and equipment from Mather AFB to Beale AFB would require about 25,000 gal of diesel fuel. The conservative mileage for military buses carrying 16 or more passengers is 5.0 mpg (ORNL 1985). Sixty-one repetitions of the 120-mile round trip distance at 5.0 mpg would require approximately 1,500 gal of diesel fuel.

Movement of supplies and equipment to the DRMO at McClellan AFB would result in consumption of about 200 gal of diesel fuel. Transportation of personal and U.S. Air Force motor vehicles would also result in consumption of diesel fuel and gasoline. Quantities would be less than those given above due to the smaller number of vehicle miles travelled.

4.1.3 Air Quality

Diesel powered tractor trailer rigs for the transport of all personal belongings, equipment, and materials from Mather AFB to Beale AFB (approximately 60 miles) would emit hydrocarbons (HC), carbon monoxide (CO), and nitrogen oxides (NO_x).

Under the "worst-case" assumption that 135,600 miles by truck and 7,200 miles by bus are required to accomplish the move, and using the same emission rate for both, the estimated air pollutant emissions from truck and bus traffic would be about 2,300 lb CO, 800 lb HC, and 3,500 lb NO_x (each number reflects totals for the assumed 9-month period). These amounts represent insignificant fractions (less than 0.01%) of current estimated mobile source emissions in Sacramento County, and thus would have a negligible effect on

air quality. Given the much shorter distance from Mather AFB to McClellan AFB, air emissions for transporting materials to the DRMO, and their associated potential impacts, would be even less.

The short-term air quality impacts from implementation are anticipated to result only from emissions from transporting personnel and equipment. No demolition of existing structures (potential fugitive dust source) is anticipated. Additionally, all volatile hazardous materials to be removed will be in closed drums or other air-tight containers. The slight increase in mobile source emissions during the implementation period should be offset by the concurrent decrease in emissions due to cessation of normal base operations.

4.1.4 Noise

Air and/or ground transportation activities would be expected to increase during the scheduled period of the proposed closure action. The closure action would result in 31 plane flights from Mather AFB to Beale AFB. Assuming these flights are spread out over 9 months, the average daily aircraft activity at Mather AFB should not significantly increase, and the noise footprint shown in Fig. 3.1 should not measurably increase due to implementation.

The transportation of equipment and personnel from Mather AFB has the potential to generate noise along the transportation corridors. Because the incremental average daily traffic added by the proposed action to the routes from Mather AFB to Beale AFB, and from Mather AFB to McClellan AFB, is small, the movement of personnel and equipment should have a negligible impact on current noise levels along the routes. To mitigate the potential for adverse noise impacts to residential areas, moving activities would be conducted from 7 a.m. to 7 p.m. whenever practicable. Transportation during times of high traffic loads (e.g., rush hours) will be avoided (Sect. 4.1.1).

4.1.5 Solid Waste

The Sacramento County Landfill is the site of disposal of solid wastes produced at Mather AFB. Packing activities typically result in a temporary increase in solid waste production due to the discarding of unwanted materials, and the same should be expected as the closure and move activities at Mather AFB are implemented. If the total weight of waste generated during the move was 1% of the total weight of materials moved (over the assumed 9-month time frame), the waste (100 tons) would be about 2% of current levels generated by Mather AFB, and thus would have an insignificant effect on the life of the landfill.

4.1.6 Ecology

Withdrawal of personnel, equipment, and supplies from Mather AFB would not result in any construction or demolition activities, nor is it expected to produce any liquid effluents. For these reasons, implementation of the proposed action offers little potential to

affect ecological resources. Withdrawal actions are expected to be confined to the main base, housing area and roadways and runways, and thus should not adversely affect vernal pools, Mather Lake, or burrowing owl habitat. Air pollutant emissions from transportation equipment are small compared to existing Mather AFB emissions and to current estimated Sacramento County emissions, and should also have minimal effects on ecological resources.

4.1.7 Other

Accidents could occur during truck transport associated with the proposed action. In 1987 the accident rate for heavy trucks was 1.2 accidents (fatal and nonfatal) per million miles traveled (NSC 1988). Using this rate as a frame of reference indicates that there is a 0.16 probability of an accident involving a truck during the entire move operation to Beale AFB. Since no hazardous materials are assumed to be shipped to Beale AFB, any accident that did occur would not represent a unique threat to the environment because of the cargo being transported. The 66 truck trips for moving materials to be excessed at the DRMO at McClellan AFB would result in a total of about 1,122 miles. This assumes that all cargo is hazardous, thus requiring trucks to use the long route (23 miles) when full and the short route (11 miles) when empty. The estimated probability of accident occurrence for the entire move would be about 0.0013 using the above accident rate. Accidents involving hazardous materials have the potential for environmental impacts of greater severity than accidents involving movement of personal belongings and equipment. To minimize the potential for adverse impacts, all hazardous materials shipments will be done in accordance with applicable laws and regulations (Sect. 1.4).

Conducting the movement of personnel, supplies and equipment could have temporary beneficial socioeconomic impacts through increased activity of local moving and packing firms (if private companies are used). If U.S. Air Force personnel and equipment are used for packing and moving, secondary beneficial socioeconomic impacts could result from expenditures by these temporary duty personnel. In either case, potential effects would be small and short-term.

Carrying out the withdrawal of personnel, equipment, and supplies from Mather AFB would not change current land use on base nor would it affect off-base land use in the vicinities of Mather, McClellan or Beale AFBs. Given the absence of historical resources on base, implementation would have little potential to affect cultural and historical resources.

Although some floodplain areas are present at Mather AFB, implementation of the proposed action is not expected to significantly affect the floodplains or floodplain values (see Sects. 4.1.6 and 4.1.7). The locations of the areas of expected high activity during withdrawal actions are not located in the floodplain, and the lack of construction/demolition activities represents little potential to affect floodplains or their values.

4.2 RESIDUAL

4.2.1 Land Use

As noted in Sect 3.1, Mather AFB operations have extensive effects on the use of lands outside of the base, but within the controlled zones (CZs) and accident potential zones (APZs). Land uses around Mather AFB are influenced through the system of recommendations on the types and densities of developments that should occur within each area. In addition, the Air Force owns the area within the CZs where no development is permitted.

Cessation of operations at Mather AFB would allow the release of the CZs to private ownership and the elimination of land use restrictions within the APZs, and would also remove the (airflight) noise impacts from the area shown in Fig. 3.1. Development of these areas would in turn trigger short-term effects from construction (e.g., noise, air emissions, traffic, etc.) and long-term effects from business and residences that are built (e.g., wastewater, traffic, air emissions, solid waste, etc.). Development would be subject to the appropriate local and regional land use controls, which include a pre-project consideration of potential environmental impacts in accordance with public review and participation. It is strongly recommended that any changes in zoning and land use after closure be done after specific reuse options for Mather AFB have been identified.

4.2.2 Energy Use

Closure of Mather AFB would result in cessation of current energy use patterns (Sect. 3.3). Principal components of energy use are hydrocarbon fuels and electricity. The energy use associated with the 323rd FTW would be transferred to Beale AFB, and the remaining energy use at Mather AFB would stop, except for small energy needs associated with base security. The decrease of hydrocarbon fuel use from Mather AFB closure is expected to represent a minor net energy savings to the region. Similarly, the cessation of electricity use is expected to result in minor electricity supply savings in that electricity used by Mather AFB typically represents less than 0.1% of the total electricity supplied by the SMUD (see Sect. 3.2). This minor impact would be beneficial in that it would reduce the electricity purchased by the SMUD to meet current demands (EIA 1988).

4.2.3 Air Quality

Implementation of the proposed action would virtually eliminate air pollution emanating from Mather AFB. Emissions would cease from sources such as aircraft, ground vehicles, operations, fire training, employee commuting, base housing, and others. As shown in Sect. 3, Mather AFB emissions make up a small proportion of the county-wide total annual emissions. Cessation of these emissions would slightly improve the regional air quality—in particular, the reduction in carbon monoxide emissions is desirable since currently a portion of the county is in a non-attainment status.

Some of the civilian and military employees at Mather AFB may remain in the Rancho Cordova area. The pollutant emissions associated with these persons (e.g., vehicular pollution from commuting or pollution associated with home heating) in these cases would persist. Given the estimated small number of positions involved, effects are ~~likely to~~ would be minor.

4.2.4 Water Resources

Closure of Mather AFB is expected to result in minor beneficial impacts to surface and groundwater resources. In terms of surface water, the proposed action would result in a reduction in industrial and domestic inflows to local sewage treatment facilities; since Mather AFB's contribution to total flow treated is less than 1% of total flows currently treated, the beneficial impacts should be minor. Also, the cessation of operations at Mather AFB would eliminate the potential for spills of petroleum products (e.g., JP-4 jet fuel, gasoline, diesel) and hazardous materials, with their associated potential effects on surface waters.

Closure of Mather AFB would also result in a minor beneficial impact on groundwater resources in the Sacramento County area through the elimination of groundwater withdrawals. Since groundwater withdrawals at Mather AFB currently result in negligible impacts on groundwater quantity, the beneficial effects from stopping the withdrawals are also expected to be slight. Closure of Mather AFB also has the potential to improve groundwater quality by eliminating the potential for spills and leaks of petroleum products and hazardous materials.

The contribution of the 323rd FTW to current water resource impacts would be transferred to Beale AFB, which affects a different regional water resource than Mather AFB. Thus, the minor potential impacts would be shifted from one region to another.

4.2.5 Waste Management

Closure of Mather AFB would result in a slight beneficial impact due to the elimination of solid waste to be disposed of at the county landfill. Because Mather AFB's contribution to the total waste received is typically less than 1% on an annual basis, impacts are expected to be negligible. Minor beneficial impacts would also result from cessation of current hazardous waste disposal activities in accordance with permit conditions. Since all PCB-containing items would be removed from Mather AFB under the assumed closure scenario, potential effects from the use and storage of PCB's would be eliminated from the immediate vicinity of Mather AFB. To the extent that it is present in existing structures, asbestos would remain at Mather AFB but would represent little potential for adverse environmental impacts. Any asbestos currently awaiting disposal at Mather AFB would be removed under the assumed closure scenario, and thus would not represent a potential residual impact (as would also be the case for pathological wastes currently in storage awaiting disposal).

Current Installation Restoration Program (IRP) activities directed at cleanup of past waste disposal sites (Appendix G) would continue at Mather AFB after the base is closed. In the near term this work will include removal of the underground storage tanks identified for retirement. In the long-term, IRP remedial action will continue until cleanup is complete.

4.2.6 Transportation

Closure of Mather AFB is estimated to result in about 3,700 fewer commuters in the Rancho Cordova area. Assuming that the occupancy rate of vehicles entering Mather AFB is 1.15 [as measured in 1981 (MTMC 1981)], then about 3,200 fewer vehicles would be present on roads in the vicinity of Mather AFB. This level of traffic reduction would represent a slight beneficial impact in that some of the key intersections near Mather AFB are approaching capacity but the estimated Mather AFB traffic loads are 1% of current traffic (Sect. 3.6). Cessation of deliveries of supplies to Mather AFB would also reduce traffic levels and help improve flow. The reductions in traffic from closure would be partially offset by temporary increases in traffic associated with hazardous waste cleanup activities.

4.2.7 Ecology

The Air Force has maintained Mather Lake as a viable recreational and wildlife resource by regularly pumping water to maintain its present level. Closure of the Base and cessation of pumping would result in about a two-thirds decrease in the size of the lake. Water levels would fluctuate with the wet and dry seasons. These changes would decrease the recreational value of the lake and the numbers and the species of fish in the lake due to overcrowding of the fish and changes in depth and temperature of the lake during the dry periods. In addition, the lake would no longer support as many migrating waterfowl, wading birds, and coots.

Closure of the base would also invalidate the current cooperative agreement for fish and wildlife management (Crowl 1985); thus all habitat improvement and maintenance programs would be cancelled unless new agreements are established. The management agreement includes provisions for locating and mapping burrowing owl dens on Base for proper protection and mowing the areas inhabited by the owls to provide the required short grass and open area needed to maintain or increase the population. Some impacts to this California species of special concern might be expected if habitat conditions change due to closure of the Base.

The participation of the California Department of Fish and Game as a cooperating agency in the preparation of the EIS will result in careful evaluation of the effects of closure on the burrowing owl population, the vernal pools, and Mather Lake. It is possible that closure of Mather AFB might result in potential benefits to the burrowing owl populations for the short term because decreased activity on the Base might result in increased species for prey (e.g., rodents, small mammals, etc.).

4.2.8 Other

Some of the residual potential biophysical impacts from closure of Mather AFB could result in minor adverse socioeconomic effects. Closure would result in loss of revenues to producers and suppliers of petroleum products to Mather AFB. Loss of wastewater effluent to be treated and solid waste requiring disposal would result in short-term decreases in revenues to municipal agencies, which in turn could trigger slightly higher rates for other users. However, given the economic growth of the area and the small percentage of total wastes (and revenues) contributed by Mather AFB, impacts are expected to be minor and of short duration.

Some damage to buildings and structures could occur at Mather AFB depending upon the length of time the base is on cold standby. Lack of heating and air conditioning could accelerate weathering and other deterioration of structures, with resultant potential socioeconomic effects due to the reduction in value of these structures. In light of the climate of the Sacramento area, potential effects are not anticipated to be as severe as those in regions of the U.S. that experience cold winters and hot, humid summers.

Given the nature of the proposed action and the lack of historical resources present at Mather AFB, there is little, if any, potential for residual impacts on cultural and historical resources. As indicated in Appendix F, the Department of Defense and the Advisory Council on Historic Preservation are considering a nationwide agreement to take historic properties into account during base closures.

Residual impacts on floodplains and floodplain values should be minor and beneficial given the cessation of base operations (see also Sections 4.2.4, 4.2.7, and 4.2.8), except for ecological impacts to Mather Lake (Sect. 4.2.7). Measures are suggested to mitigate potential impacts to Mather Lake by continued pumping to maintain lake levels (Sect. 4.4). Alternative sites and/or actions to avoid potential effects to Mather Lake are not relevant given the nature of the proposed action addressed in this EIS.

4.3 CUMULATIVE IMPACTS

Potential short-term impacts from this action may occur in the areas of energy use, air emissions, traffic, and noise generation associated with packing, dismantling, and moving current operations. Such effects are likely to be insignificant when considered in the context of existing impacts from other sources in the region of influence on Mather AFB, and when considered in the context of the time frame (9 months) over which they are expected to occur.

Potential residual effects to the biophysical environment are primarily beneficial due to the loss of emissions, effluents, traffic, and energy use. To some extent these decreases are offset by increases in these same factors at Beale AFB, which are being addressed in the

Beale AFB Realignment EIS (54 *Fed. Reg.*, 6254, Feb. 8, 1989). For the impact areas of ecology, water resources, traffic, energy use, solid waste, and localized air quality problems such as high carbon monoxide levels, Beale AFB can be generally assumed to be located outside of the region of influence of Mather AFB, thus offering little potential for cumulative impacts (i.e., impacts are transferred from one region to another rather than "accumulating" in a given region). For regional pollution problems such as high ozone levels, the same affected region may experience a very small net decrease in ozone levels due to this proposed action.

Long-term cumulative impacts may result from the reuse of Mather AFB. These impacts will be addressed in the EIS addressing reuse of Mather AFB (54 *Fed. Reg.*, 6256, Feb. 8, 1989).

Closure should result in little potential for adversely affecting cleanup of hazardous waste sites under IRP. Since an approved work plan for the cleanup is not available, information on the timing, nature, and extent of cleanup operations is not available for evaluation. However, most of the cleanup sites identified in the IRP Preliminary Assessment are located away from base housing and the main base area, where the heaviest activity of packing and moving is expected, and thus there is little potential for closure to adversely affect activities at these sites. One potential residual cumulative impact is that stopping operation of Mather AFB's production wells may affect water levels in groundwater monitoring wells associated with the clean-up activities. A sufficient amount of groundwater data collected before and after closure will allow understanding of the potential effects of Mather AFB's production wells on groundwater behavior, and cleanup activities can be designed accordingly. If Mather AFB is on cold standby for only a brief time period, the net effect of closure on the groundwater regime would be minimal, with correspondingly minor effects on hazardous waste cleanup.

4.4 MITIGATION

Mitigation measures to reduce the impacts of closure on wetlands and plant and wildlife species, some of which may be federally listed or candidates for federal listing (Appendix D), depend on preliminary investigations to locate and describe the resources. First, a program to locate and map the distribution of the burrowing owl nest sites and the subsequent development of a management plan is required in order to aid decisions involving habitat protection, manipulation, and future land use. Second, the location and value of the vernal pools must be determined. A systematic survey of the pools is needed to determine the presence of any special status plants. Third, a constant water level should be maintained in Mather Lake by continued pumping during the dry season. The lake is a valuable resource for wildlife and recreation. And finally, an overall management plan should be developed to preserve and enhance the wetlands, wildlife, and plants and to ensure their protection when the Base is no longer a military reservation. The U.S. Environmental Protection Agency (U.S. EPA) recommends preservation and enhancement of existing wetland and riparian resources. The Agency suggests that the Air Force consider

the transfer of sensitive or valuable habitat and natural resources to resource agencies in order to optimize environmental benefits (J. Wyland, Chief, Office of Federal Activities, U.S. EPA, personal communication to Lt. Col. R. Voorhees, U.S. Air Force, April 5, 1989).

To mitigate potential impacts from noise of moving operations on residents in the vicinity of Mather AFB, the U.S. Air Force will conduct operations during daylight hours whenever practicable.

Transportation routes and timing will be established to minimize contributions to areas of high traffic loads.

Closure activities will be carried out over at least a 9-month period to distribute over time potential effects from withdrawal of personnel, equipment, and supplies.

Structures on Mather AFB that are known to contain asbestos will be visually inspected on a periodic basis to ensure that they have not become damaged during severe weather conditions, thereby potentially exposing the environment to asbestos.

4.5 UNAVOIDABLE ADVERSE IMPACTS

Most of the avoidable impacts associated with the proposed action are those identified in Sect. 4.2, and they are primarily beneficial due to the elimination of emissions, effluents, and solid wastes. An exception is the loss of managed ecological resources. Burrowing owl habitat and vernal pool areas would still be protected after the Base is closed in that the base would be locked and guarded. Failure to maintain the level of Mather Lake by pumping would adversely affect biota now present in the lake. In addition, implementing the proposed action would result in the following minor unavoidable adverse impacts:

- A temporary increase in noise is expected due to increased air and ground transportation associated with closure.
- Implementation of the closure plan will result in a temporary decrease in air quality as a result of the increased air and ground transportation required by closure.
- Increased traffic would result from transporting materials to Beale AFB and to McClellan AFB.
- A temporary increase in solid waste is expected due to the consolidation of materials for packing and the discarding of materials not planned for relocation to Beale or for excessing through the DRMO at McClellan AFB.

4.6 RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Typically a "short-term use" involves the construction and operation of a proposed facility over a specified time frame. The short-term "use" under evaluation in this EIS is actually a suspension of current actions. Continued activities should result in fewer potential adverse impacts to the physical and natural environment than those occurring under current use. In addition to current use, the potential future uses of the Mather AFB property can be examined. Given surrounding land uses and the geologic history of the area, the site of Mather AFB offers potential for agriculture and mineral resource extraction (gold mining). Mather AFB total acreage represents about 1% of total agricultural acreage in Sacramento County (1983 data); thus, the base does not represent a significant resource in terms of long-term agricultural productivity. Mineral resources located under Mather AFB have not been well documented; however, historical records and documents, and comments made during scoping, suggest that substantial gold resources could be present. No other noteworthy physical and natural features of Mather AFB are relevant to long-term productivity.

4.7 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

There will be a temporary energy use resulting from the transportation requirements of the closure action. Other minor resources that would be irretrievably committed are landfill capacity and resources used to manufacture packing materials and tires on moving vans. Because there is no construction or demolition planned for the proposed closure of Mather AFB, the potential for irreversible and irretrievable commitments of resources is low.

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5. LIST OF PREPARERS

C. R. Boston	Ph.D. Chemistry, Northwestern University; B.S., Chemistry, Ohio University; 15 years experience in environmental impact assessments and program management. Contribution: Program management, NEPA Review.
M. P. Bucka	M.S. Engineering, University of California, Los Angeles; B.A. Applied Physics, University of California, San Diego; 9 years experience in acoustical engineering. Contribution: Noise analysis.
J. T. Ensminger	M.S. Biology, B.S. Environmental Sciences, East Tennessee State University; 14 years experience in analysis of health and environmental effects of pollutants and program management. Contribution: Safety, energy use, solid and liquid wastes, transportation.
C. W. Hagan, Jr.	M.A. English and B.S. Biology, Virginia Polytechnic Institute and State University; 7 years experience editing and compiling environmental impact assessments. Contribution: Technical editing.
D. B. Hunsaker, Jr.	D. Env. (Doctor of Environmental Science and Engineering), University of California, Los Angeles; M.S. Chemistry, Wayne State University; B.S. Chemistry, University of Wisconsin at Whitewater; 12 years experience in environmental impact assessment. Contribution: Project Management, Chapter 1, Chapter 2.
L. N. McCold	M.S. Mechanical Engineering and B.S. Physics, Oregon State University; 10 years experience in energy-related environmental research. Contribution: Noise; Chapter 3 organization.
M. A. Mitckes	M.S. Chemical Engineering and B.S. Chemical Engineering, University of Tennessee; 18 years experience in air quality impact assessment. Contribution: Air quality.

L. L. Sigal	Ph.D. Botany and Microbiology, Arizona State University; M.A. Ecology and Systematic Biology, San Francisco State University; 10 years experience in environmental assessment of ecological systems. Contribution: Terrestrial and Aquatic Ecology.

APPENDIX A

NOISE METRICS

APPENDIX A - NOISE METRICS

BASIC ATTRIBUTES OF SOUND

The word noise is in wide use in many fields of technology today, but, limiting discussion to its use in relation to sound, one may define noise loosely as unwanted sound. For our purposes, an acceptable definition of sound is that it is a physical disturbance of the atmosphere that can be detected by the human ear. Factors which influence people's perception of such physical disturbances as "noise" are

- the magnitude of the sound level,
- the duration of the sound event,
- the number of such events in a given time period (such as a day), and
- the time of day of these events.

The results of this analysis quantify these effects in terms of the noise metrics used in this report. These are described in the following sections.

A MEASURE OF INSTANTANEOUS SOUND LEVEL

A basic fact of human audition is that the human ear is more sensitive to sound energy at higher frequencies than at lower frequencies (that is, the ear does not have a "flat" frequency response). Furthermore, the ear's relative sensitivity to different frequencies changes somewhat with the level of the sound. This effect, however, is most pronounced at lower sound levels. Any sound level measure which purports to correlate well with people's subjective assessment of the loudness or noisiness of sound must account for this variable sensitivity to differing frequencies.

The A-Weighted Sound Level

One early approach for obtaining good correlation between measured sound levels and subjective human response was the introduction of frequency weighting networks in sound level meters.* With origins dating back to the mid 1930s, the A-weighting network is still in widespread international use today. This network discriminates against the lower

*The sound level meter is a device for measuring sound pressure levels. The small pressure fluctuations are detected by an extremely sensitive microphone and transformed into an electrical signal. By means of electronic circuitry this electrical signal is amplified and displayed on a meter directly in decibels.

frequencies and very high frequencies, to which the ear is less sensitive, according to a relationship approximating a person's subjective reaction in terms of loudness at moderate sound levels.

In past laboratory and field studies, it has been found that people make relative judgments of the "loudness," or the "annoyance" or "disturbance" of sounds that correlate quite well with the A-scale levels of those noises. However, a change of 10 dB in the A-level corresponds roughly to a subjective judgment of the halving or doubling of the loudness or noisiness. In other words, a sound judged to be twice as loud as another sound would have a sound level approximately 10 dB greater than the first sound (even though the 10 dB change corresponds to a factor of 10 in actual sound energy). On the other hand, a difference of one or two dB between sounds, although probably detectable if heard within a short time interval, would not be judged to be significantly different in loudness by most observers. Figure A.1 shows the relationships between A-weighted sound level and relative loudness for every-day noise sources.

A MEASURE OF INDIVIDUAL NOISE EVENTS

"Transient" noises comprise a broad category of noises which come and go in a finite period of time. As illustrated in Fig. A.2, aircraft takeoff, landing, and flyover noises may be characterized as sound signals that increase in level, generally over a period of several seconds, to a maximum value and then decrease and eventually merge into the fluctuating background noise.

Dependent primarily upon the type of aircraft, type of operations, and distance from the observer to the aircraft, the maximum flyover noise levels will vary widely in magnitude, ranging from levels unnoticed in the presence of other background noises to levels sufficiently high to create feelings of annoyance or to interfere with speech communication or sleep.

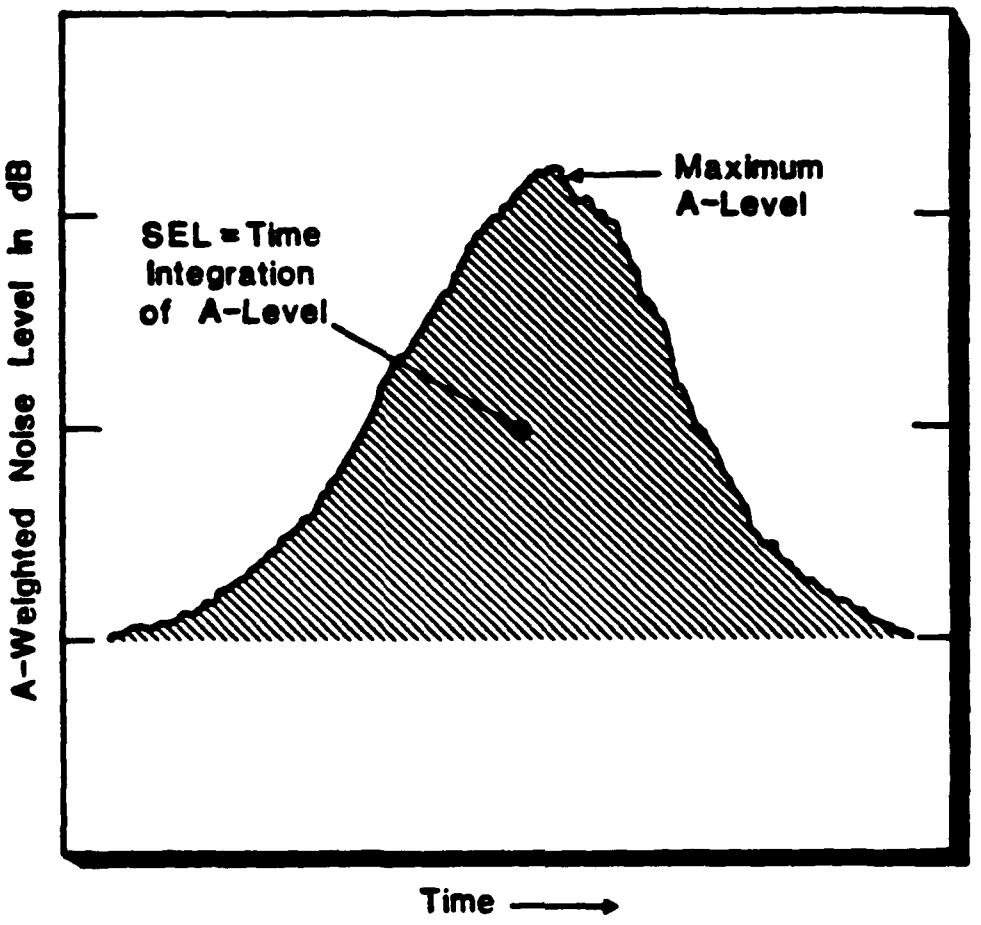
The duration will also vary depending on the proximity of the aircraft, speed, and orientation with respect to the observer. Unfortunately, the maximum noise level rating ignores the duration aspect of the event. Extensive psychophysical research has shown that for two events of the same maximum level, the longer of the two will invariably be rated as the noisier or more annoying.

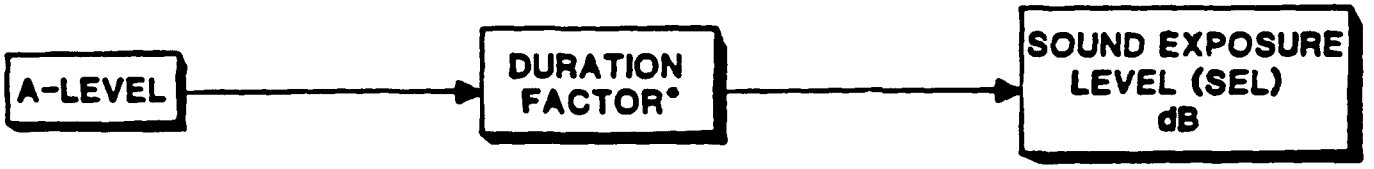
Over the years, several mathematical models have been proposed to account for this not-so-surprising observation. The model which is in common usage today asserts that subjective annoyance is related to the total amount of perceived acoustic energy in the noise intrusion. Computationally, the total energy is determined by measuring the instantaneous A-level at closely spaced intervals in time (e.g., every 1/2 second) and summing these readings by logarithmic addition.

SOUND	SOUND LEVEL[1] dB(A)	RELATIVE LOUDNESS (Approx.)	RELATIVE SOUND ENERGY
Jet Plane, 100 Feet	130	128	10,000,000
Rock Music with Amplifier	120	64	1,000,000
Thunder	110	32	100,000
Boiler Shop, Power Mower	100	16	10,000
Orchestral Crescendo at 25 Feet, Noisy Kitchen	90	8	1,000
Busy Street	80	4	100
Interior of Department Store	70	2	10
Ordinary Conversation 3 Feet Away	60	1	1
Quiet Automobile at Low Speed	50	1/2	.1
Average Office	40	1/4	.01
City Residence	30	1/8	.001
Quiet Country Residence	20	1/16	.0001
Rustle of Leaves	10	1/32	.00001
Threshold of Hearing	0	1/64	.000001

[1] U.S. Department of Housing and Urban Development Circular 1390.2

Fig. A.1. Sound level of common sounds.





*Time Integration of Signal

Fig. A.2. Noise measures for single events.

The analyses in this report are based on the SEL (Sound Exposure Level), which is the energy summation of the A-level over the upper 10 dB of the noise signal. The SEL is computed by the following formula:

$$SEL = 10 \log \sum_{i=1}^{N} 10^{\frac{\text{A-level}_i}{10}} - 3 .$$

The 3 dB constant normalizes the duration to 1 second.

The SEL (or SENEL) is being widely used to describe the noise of a variety of transportation noise sources, with application not restricted to aircraft. Figure A.2 illustrates the relationship between A-level and Sound Exposure Level for a typical noise event.

A MEASURE OF DAILY NOISE EXPOSURE

Any single-number descriptor of a complex noise environment represents a drastic simplification of the real-world conditions. However, the administrative, simplicity and general usefulness of a single number descriptor results in widespread use of such measures for regulatory, administrative and planning purposes. The U.S Air Force has adopted the Average Day-Night Sound Level (DNL or Ldn) as the measure of the noise environment over a 24-hour period, which is in use in several different state noise regulations and is widely employed throughout the country as a descriptor of community noise environment.*

The Ldn represents the equivalent level (also denoted as average level) over a 24-hour period with the noise occurring at night (10 p.m. to 7 a.m.) multiplied by a factor of 10 (10 dB). The Ldn incorporates a 10-dB nighttime weighting for noises occurring between 10 p.m. and 7 a.m. to account for the presumed greater potential disturbance of people by nighttime noise. This presumption is partially substantiated by community complaint studies and social survey data which indicate that the same noise environment is considered more disturbing or annoying during the nighttime than during the daytime. There is a greater need at night for a quiet environment in which to sleep and relax. In most communities the exterior background noise level decreases during the night by 10 dB

*The National Research Council Committee on Hearing, Bioacoustics and Biomechanics (CHABA) favors Ldn as the fundamental measure for assessing the noise environment potentially requiring an Environmental Impact Statement. The Ldn is used by the Department of Defense in describing the noise exposure in the vicinity of military air bases, and it is one of the noise measures employed by the FAA in describing the noise environment around airports. The day-night average level was adopted by the Department of Housing and Urban Development (HUD) in its recently revised noise policy regulations.

or more, and the activity inside homes also decreases. These both contribute to a general lowering of interior noise levels. Consequently any high-level intrusive noise can be expected to be more disturbing during the night.

The Ldn may be determined in two different ways. It may be calculated by measuring the noise either continuously or on a discrete sampling basis throughout the 24-hour period. In practical applications, Ldn is usually computed by sampling the noise one or more times a second and calculating the equivalent level (as described above) for each hourly period to obtain "hourly noise levels" (HNL). The Ldn is then computed from the set of 24 hourly levels, after adding the appropriate weightings to the evening and night levels.

Close to major airports, the Ldn contributions from aircraft noise will generally be much greater than that from other sources, hence, the total Ldn value due to aircraft will equal the total Ldn value for the site. At distances farther from the airport, at smaller airports, or near other major noise sources, the Ldn values resulting from aircraft may not fully account for the noise exposure at the site. In such situations, noise from other sources must be taken into account in determining the total Ldn for that site.

Figure A.3 shows the average sound exposure level (SEL) of noise events and the weighted number of such noise events per 24-hour day required to reach specified Ldn values. For a weighted number of 10 events per day, the SEL must be approximately 104.5 dB to have a Ldn of 65 dB. For a weighted number of 100 events, SELs of approximately 94.5 dB are required for a Ldn of 65 dB.

Ldn CRITERION VALUES

Current Air Force guidelines, in the Air Installation Compatibility Use Zone (AICUZ) programs, stipulate Ldn 65 as the upper limit for residential development unless special noise insulation features are incorporated in buildings. The choice of 65 dB involves an administrative decision which necessarily involves tradeoffs between desire to eliminate all community annoyance with aircraft noise and consideration of economic and political factors, as well as community and military needs for air transportation.

The choice of a 65 dB Ldn criterion is supported by regulations and administrative standards adopted by other governmental agencies. For example, the Department of Housing and Urban Development (HUD) has adopted an Ldn level of 65 dB as the upper limit of acceptable aircraft and non-aircraft noise with regard to residential development and governmental funding for community planning. The DNL (or Ldn) value used by the FAA to define residential noise impact areas around airports is 65 dB. A recent American National Standard Institute (ANSI) standard on land use planning with respect to noise also suggests a limit of Ldn 65 for residential land use.

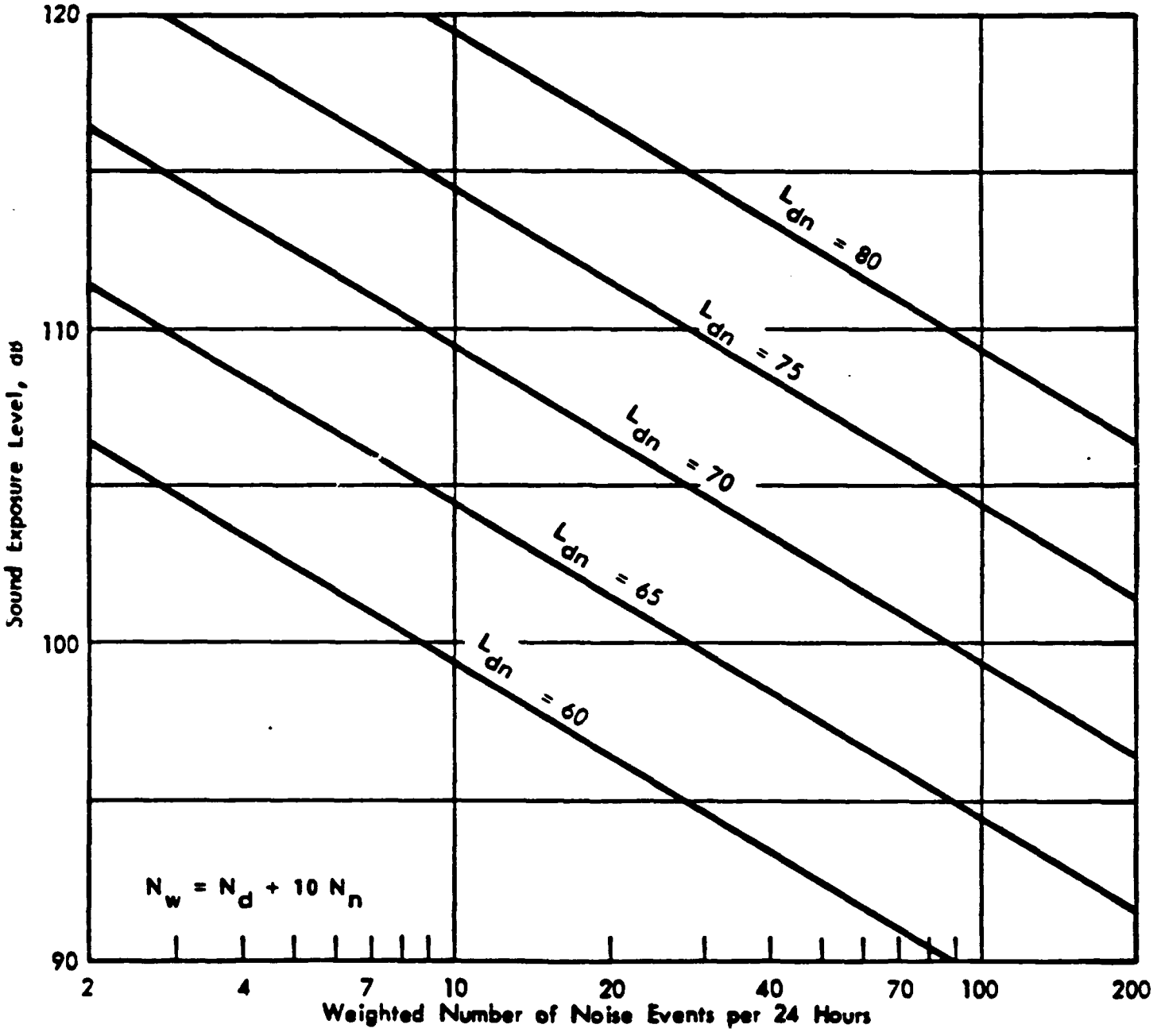


Fig. A.3. Relationship between Ldn and the noise level and number of noise events.

The above discussion suggests that the criterion of 65 dB Ldn is reasonable in order to achieve a balance that takes into consideration the air transportation needs of the community and the desired goals to minimize annoyance and noise interference. However, it is clear that setting a 65 dB Ldn criterion will not eliminate all annoyance or community dissatisfaction. And, for some activities the Ldn criterion should be supplemented with other criteria regarding levels of individual noise intrusions.

Information on the amount of community response for differing intensities of noise exposure and the levels of the noise environment due to community sources other than aircraft noise can provide useful guidance in evaluating criterion values.

Figure A.4 shows an estimate of the percentage of the community judged as highly annoyed as a function of increasing day-night noise levels. This curve represents the synthesis of a number of social surveys involving people exposed to various community noise sources including aircraft. According to this study a criterion level of less than 50 dB would have to be selected to minimize the number of highly annoyed responses.* Conversely, above levels of 60 to 65 dB, the percentage of people highly annoyed increased rather dramatically.

In the absence of aircraft noise, people in suburban and urban areas are exposed to considerable noise due to other sources, the most prevalent of which is motor vehicle traffic noise. Figure A.5 shows the approximate range of day-night levels for different types of community noise exposure.

The Department of the Navy has developed land use compatibility criteria for noise. The breakdown of compatible land use categories are summarized in Fig. A.6.

METHODOLOGY, DATA, AND ASSUMPTIONS USED FOR CALCULATING NOISE CONTOURS

The input data set used to model existing operations at Mather AFB was provided by AFESC/DEMP (AICUZ) at Tyndall AFB, Florida. This data set was last updated in 1985 as a part of the regular AICUZ program.

*The U.S. Environmental Protection Agency has selected an Ldn of 55 dB as a long term goal for the outdoor noise environment.

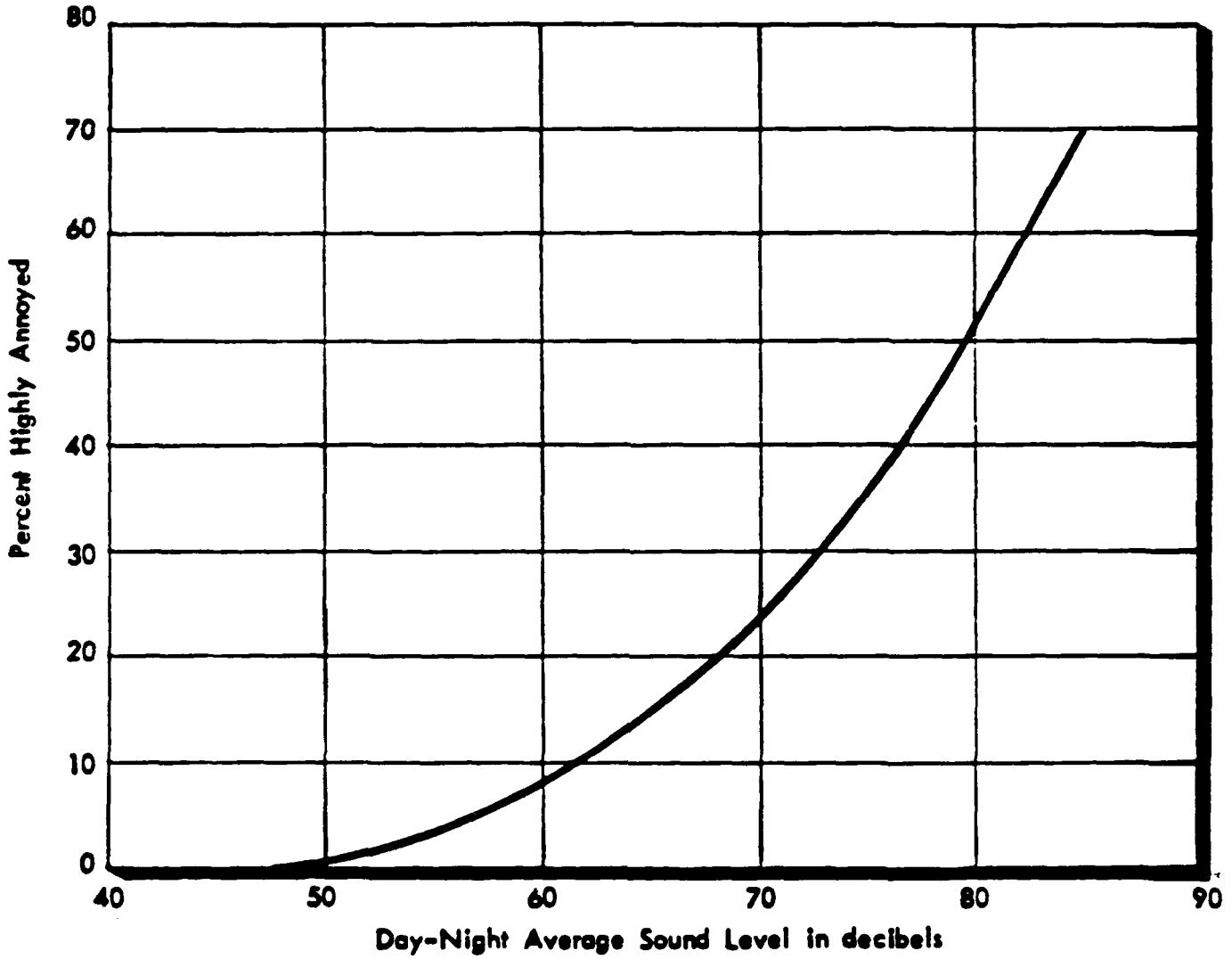


Fig. A.4. Synthesis of social survey results to indicate the degree of annoyance due to noise of all kinds (Schultz).

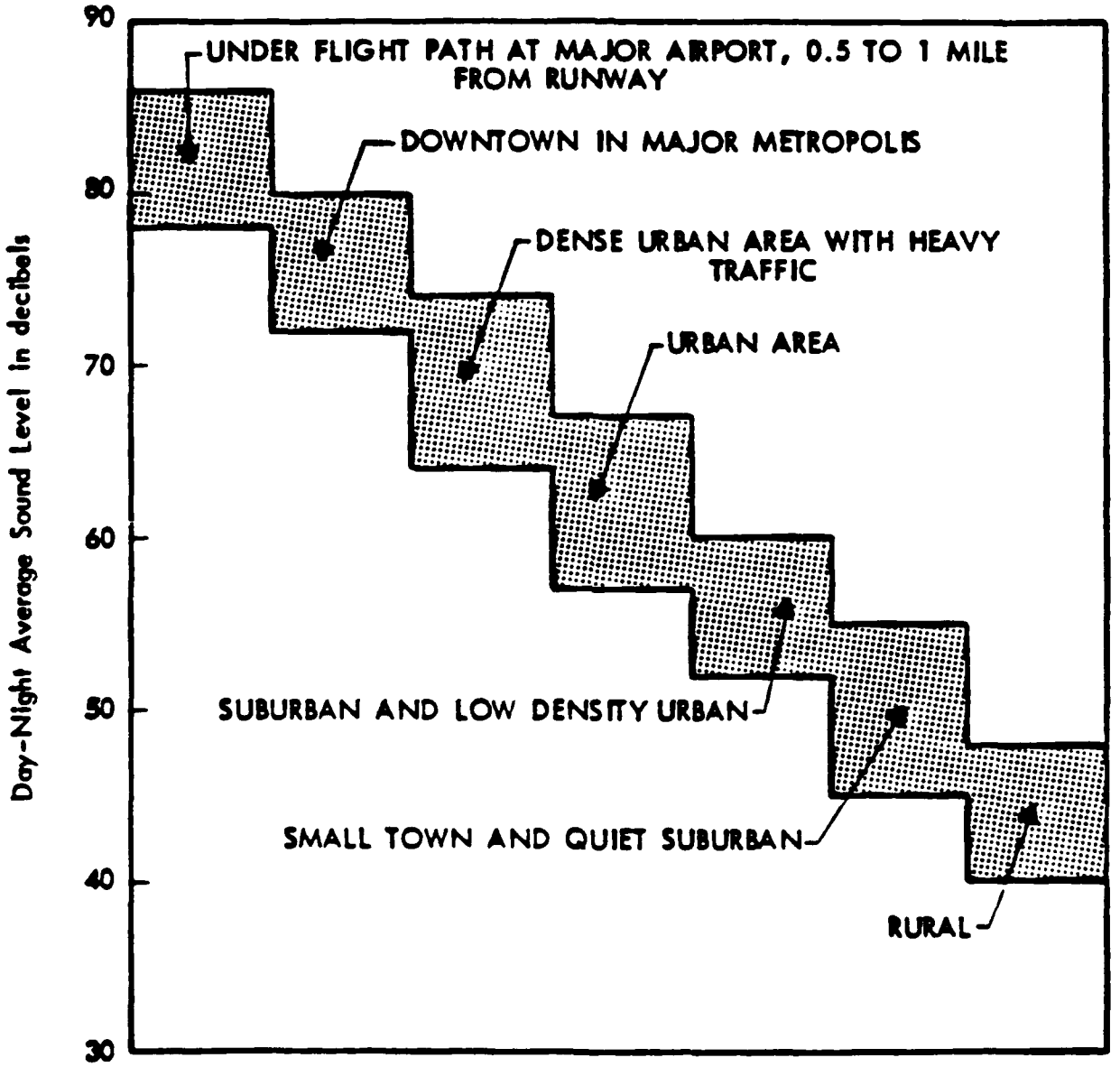


Fig. A.5. Typical range of outdoor community noise exposure levels.

LAND USE COMPATIBILITY IN NOISE AREAS

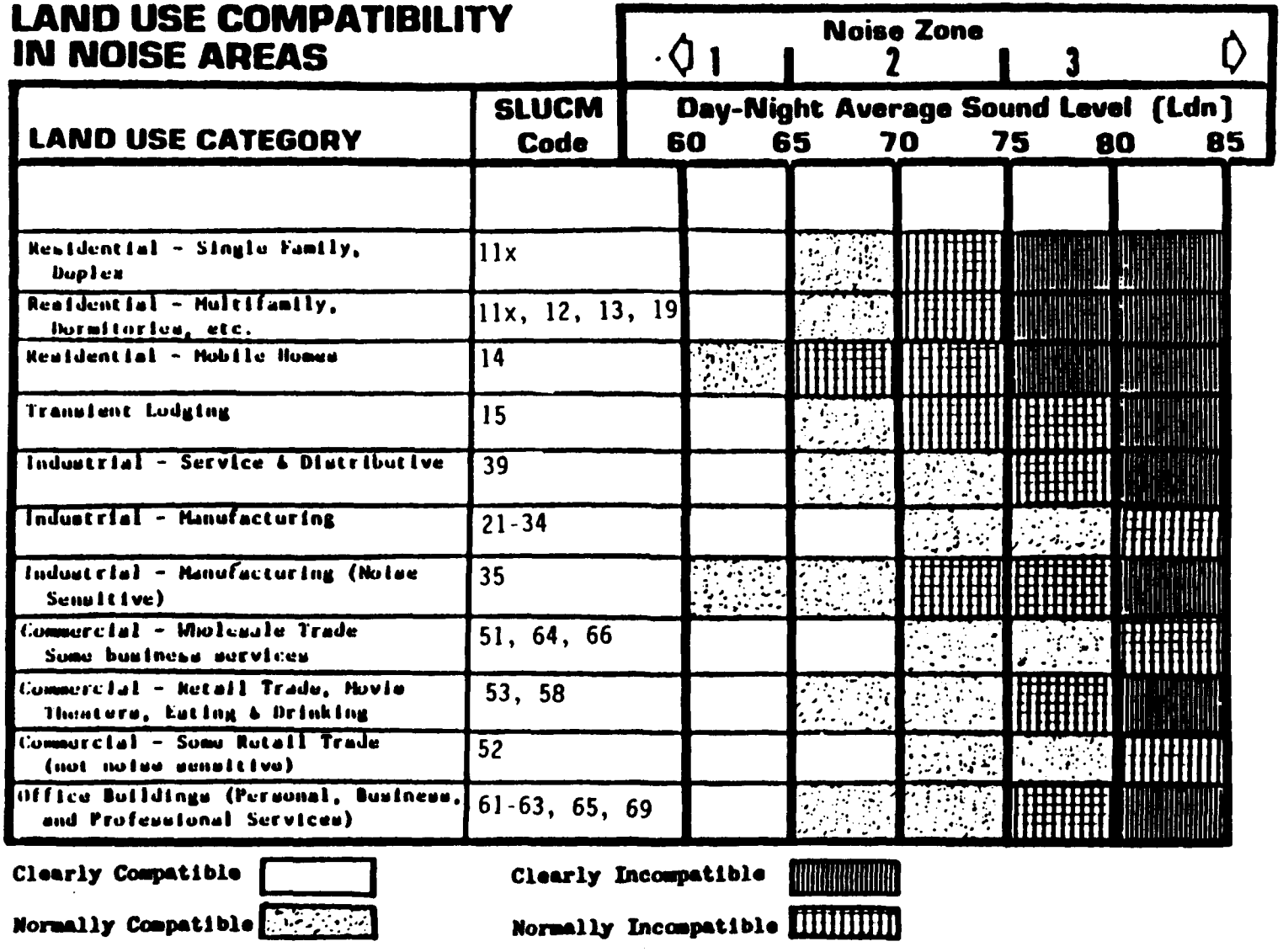


Fig. A.6. Land use compatibility by land use category for day-night average sound levels (Ldn).

LAND USE COMPATIBILITY IN NOISE AREAS

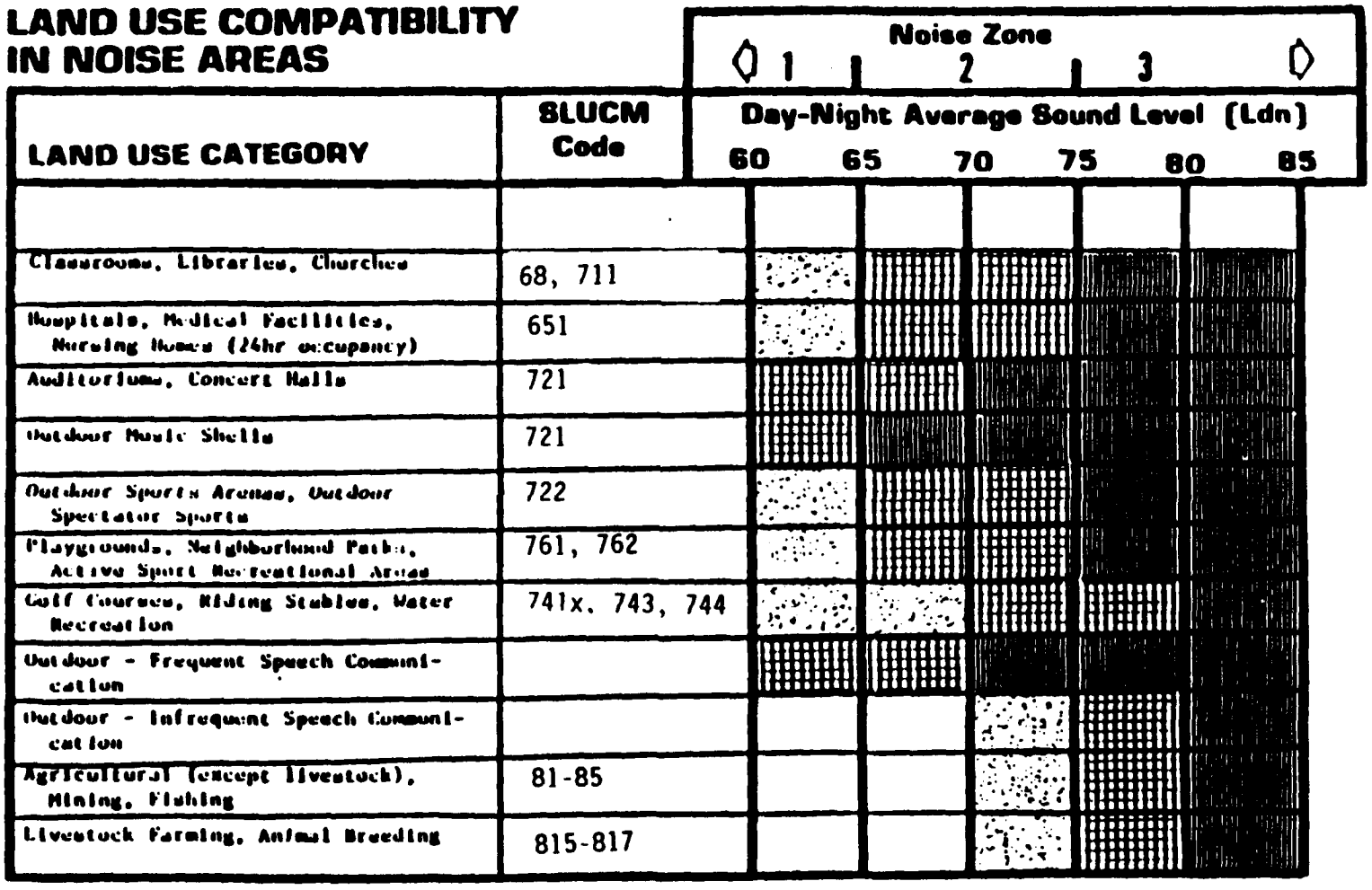


Fig. A.6. (Continued).

NOTES FOR MATRIX ON
LAND USE COMPATIBILITY IN
NOISE AREAS

1. CLEARLY COMPATIBLE: The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference from aircraft noise. (Residential areas: both indoor and outdoor noise environments are pleasant.)

2. NORMALLY COMPATIBLE: The noise exposure is great enough to be of some concern, but common building construction will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play.)

3. NORMALLY INCOMPATIBLE: The noise exposure is significantly more severe so that special building construction is often necessary to minimize adverse impacts on people and reduce interference with performance of normal activities. (Residential areas: barriers are sometimes erected between the site and prominent noise sources to improve the outdoor environment; sound attentuation is recommended in some buildings.)

4. CLEARLY INCOMPATIBLE: The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities is significantly more expensive. (Residential areas: the outdoor environment would be significantly impacted for normal residential use.)

5. SLUCM: Standard Land Use Coding Manual. "x" represents SLUCM category broader or narrower than, but generally inclusive of, the category described.

6. The compatibility matrix has been determined by a number of noise sensitivity factors including: speech communication needs; subjective judgements of noise compatibility and relative noisiness; need for freedom from noise intrusions; sleep sensitivity criteria; accumulated case histories of noise complaint experience; and typical noise insulation provided by common types of building construction.

7. For many land uses, higher levels of exterior noise exposure may be acceptable provided there is a proper degree of building noise insulation. Such tradeoffs are possible for land uses where indoor activities predominate.

Fig. A.6. (Continued).

APPENDIX B

AIR INSTALLATION COMPATIBLE USE ZONE

APPENDIX B. AIR INSTALLATION COMPATIBLE USE ZONE

In 1973, the Air Force performed an Air Force-wide accident hazard study to identify land near airfields with significant aircraft accident occurrence potential. The study reviewed reports on 369 major accidents that occurred from 1968 through 1972 within a 10-nautical-mile radius of airfields that were directly related to airfield-associated, in-flight mishaps.

Analysis of the data revealed the following:

1. Accident potential increases significantly near the extended runway centerline. Seventy-five percent of the accidents were near the extended runways centerline.

2. Fighter and training-type aircraft account for over 80% of all major AF aircraft-related accidents.

3. Nearly 61% of the accidents occurred during the landing phase (39% during the takeoff phase).

Hazard zones were selected to minimize the area necessary to include significant percentages of accidents. A zone width of 3000 ft was selected as the optimum. Zone boundaries were established at distances of 3000, 8000, and 15,000 ft. The zone closest to the end of the runway is designated as the clear zone (CZ), and the remaining zones are designated as accident potential zones (APZ) I and II. The designation of these zones and the percentage of accidents included in each zone are illustrated in Fig. B.1.

Most land uses within the CZ are incompatible with airfield operations. Within the CZ area, the overall risk is so high that the necessary land use restrictions would be so prohibitive as to allow no reasonably economic usage of these areas. The Mather AFB Comprehensive Land Use Plan (Mather AFB CLUP 1986) suggests that within the CZ, the following generalized land uses are incompatible: permanent structures, not necessarily including such uses as roads, railroads, or underground vaults; railroad development; and any use that would attract people.

APZ I is compatible with a wide variety of industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agricultural uses. However uses that concentrate people in small areas are not acceptable. Structures should be located toward the edges of this zone wherever possible.

APZ II allows the uses compatible with APZ I, and personal and business services of low-intensity or scale of operation. High-density functions such as multistory buildings, places of assembly (theatres, churches, schools, restaurants, etc.), and high-density office uses

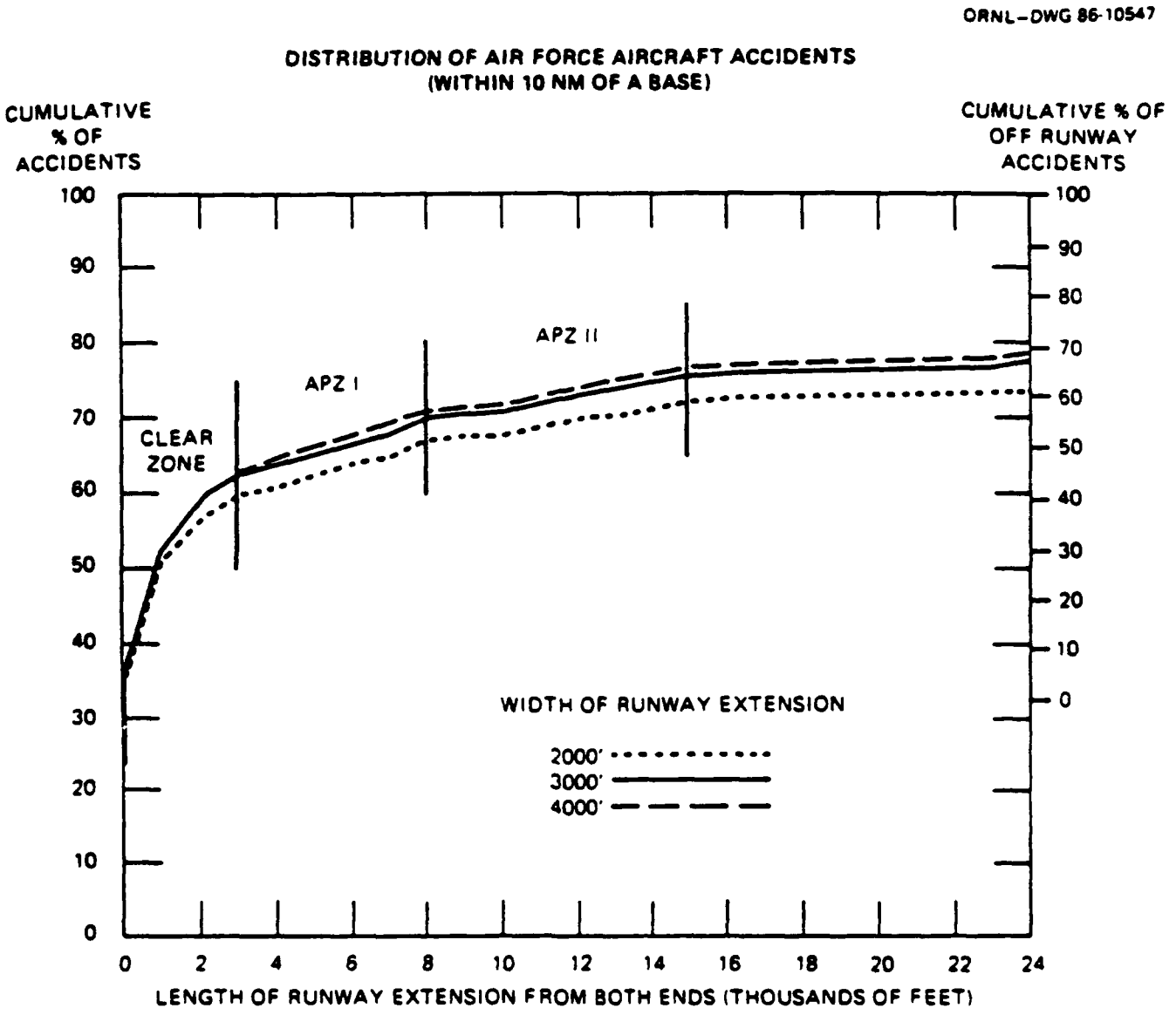


Fig. B.1. Distribution of Air Force aircraft accidents within 10 nautical miles of a base and in relationship to length of runway extensions.

are not considered appropriate. Population densities should be limited to the maximum extent possible. For most uses, buildings should be limited to one story, and the lot coverage should not exceed 20% (Mather AFB AICUZ 1982).

Figure B.2 illustrates the CZs and APZs for each runway at Mather AFB as defined in the AICUZ report issued in September of 1982 (Mather AFB AICUZ 1982). At both ends of the Mather AFB runways expanded CZs have been designated that are 3000-4000 ft wide and 3000 ft long. A large portion of the CZ at the southwestern approach to the runways lies outside of the base. A smaller piece of the CZ at the northeastern approach to the runways is also outside of the base. The APZ I areas are 3000-4000 ft wide and 5000 ft long while APZ II areas are the same width and 7000 ft long. Most of the APZ I areas are outside of the base area, and all of the APZ II areas are external to the base.

There are currently no land uses incompatible with Mather AFB operations contained within either APZ I, or APZ II (Mather AFB AICUZ 1982). The Air Force has purchased the necessary real property interest in the CZ to prevent development within the area. All of the APZ I and APZ II areas on the southeastern side of the base are conditionally compatible with existing zoning (industrial). Most of the APZ I and APZ II areas on the northeastern side of the base are also conditionally compatible with the current industrial zoning. The conditional compatibility generally refers to the incorporation of noise-level reduction, rather than a safety condition (Mather AFB AICUZ 1982).

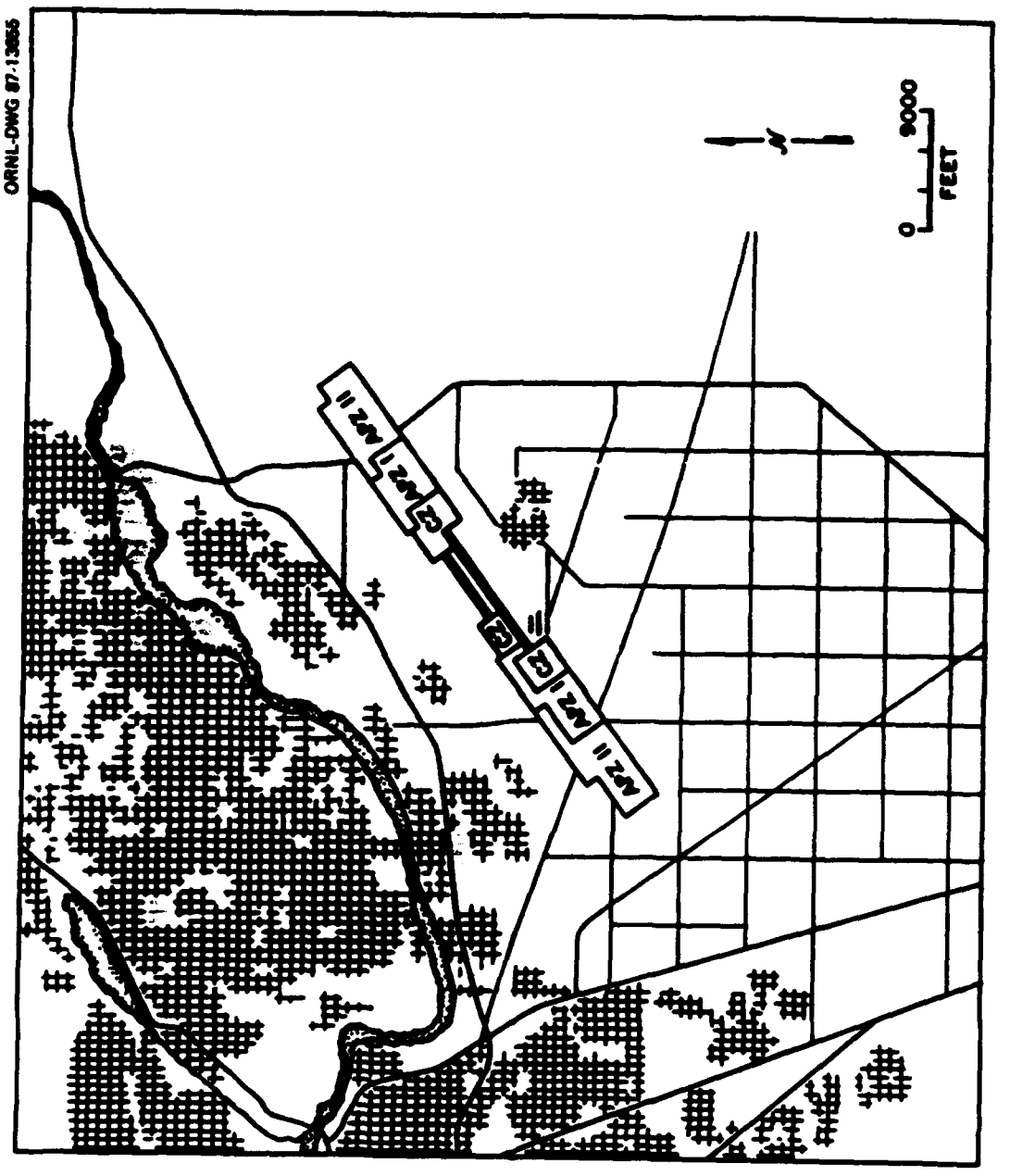


Fig. B.2. Designated safety zones at Mather AFB.

APPENDIX C

NOISEMAP PROGRAM DOCUMENTATION

APPENDIX C - NOISEMAP PROGRAM DOCUMENTATION

The NOISEMAP computer program is a comprehensive set of computer routines for calculating noise exposure contours for airport operations. The program was developed under sponsorship of the U.S. Air Force. The program permits calculation of the noise environment in terms of day-night level (DNL), noise exposure forecast (NEF) or community noise equivalent levels (CNEL). With simple modification of the input data, NOISEMAP also can develop noise level contours, typically in terms of effective perceived noise level (EPNL) or sound exposure level (SEL), for individual aircraft operations.

DNL contours produced by NOISEMAP are relied upon by the Air Force as the primary descriptor of air base noise exposure. It forms a primary technical tool for the USAF Air Installation Compatible Use Zone (AICUZ) program. NOISEMAP is also used by the U.S. Navy, U.S. Army, EPA, and several state agencies and consultants to develop noise environment contours for civil and military airports.*

The program and underlying technical concepts are very well documented in the technical reports. The basic modeling concepts, guidelines for acquiring noise performance data, an application guide and description of the basic computer program are described in the following five reports:

Bishop, D. E., Community Noise Exposure Resulting from Aircraft Operations: Application Guide for Predictive Procedure, Air Force Report AMRL-TR-73-105, Nov. 1974 [AD A004818].

Galloway, W. J., Community Noise Exposure Resulting from Aircraft Operations: Technical Review, Air Force Report AMRL-TR-73-106, Nov. 1974 [AD A004822].

Bishop, D. E., Galloway, W. J., Community Noise Exposure Resulting from Aircraft Operations: Acquisition and Analysis of Aircraft Noise and Performance Data, Air Force Report AMRL-TR-73-107, August 1975 [AD 017741].

Reddingius, N. H., Community Noise Exposure Resulting From Aircraft Operations: Computer Program Operator's Manual, Air Force Report AMRL-TR-73-108, July 1974 [AD 785360].

Horonjeff, R. D., Kandukuri, R. R., and Reddingius, N. H., Community Noise Exposure Resulting from Aircraft Operations: Computer Program Description, Air Force Report AMRL-TR-73-109, Nov. 1974 [AD A004821].

*NOISEMAP is approved by the FAA for use in FAA-funded airport studies.

The original computer program operator's manual has been updated to reflect program changes and is available as an Air Force report:

Beckmann, J. M., Seidman, H., Community Noise Exposure Resulting from Aircraft Operations: NOISEMAP 3.4 Computer Program Operator's Manual, Air Force Report AMRL-TR-78-109, December 1978 [AD A068518/OGA].

Basic noise information for military aircraft is documented in the following 6-volume report, prepared by the U.S. Air Force Aerospace Medical Research Laboratory:

Speakman, J. D., Powell, R. G., and Cole, J. N., Community Noise Exposure Resulting From Aircraft Operations: Acoustic Data on Military Aircraft, Air Force Report AMRL-TR-73-110, Nov 1977.

Vol. 1 - Acoustic Data on Military Aircraft [AD A053699].
Vol. 2 - Air Force Bomber/Cargo Aircraft [AD A053700].
Vol. 3 - Air Force Attack/Fighter Aircraft [AD A053701].
Vol. 4 - Air Force Trainer/Fighter Aircraft [AD A053702].
Vol. 5 - Air Force Propeller Aircraft [AD A055079].
Vol. 6 - Navy Aircraft [AD A056217].

A military aircraft noise data digital tape file for use with NOISEMAP is available upon request from:

6570th Aerospace Medical Research Laboratory
AMRL/BBE
Air Force Systems Command
Wright-Patterson AFB, Ohio 45433

Computer programs for computing noise vs distance curves from noise data at single ground locations have been developed by the University of Dayton and are described in the following report:

Mohlman, H. T., Computer Programs for Producing Single-Event Aircraft Noise Data for Specific Engine Power and Meteorological Conditions for Use with USAF Community Noise Model (NOISEMAP), Air Force Report AFAMRL-TR-83-020, April 1983.

Basic noise and performance characteristics for major civil aircraft were initially collected and described in several reports prepared under Environmental Protection Agency sponsorship:

Galloway, W. J., Mills, J. F., Hays, A. P., Data Base for Predicting Noise from Civil Aircraft: Flight Profile Prediction, BBN Report 2746R, March 1976.

Bishop, D. E., Mills, J. F., Beckmann, J. M., Effective Perceived Noise Level Versus Distance Curves for Civil Aircraft: BBN Report 2747R, February 1976.

Bishop, D. E., Mills, J. F., Beckmann, J. M., Sound Exposure Level Versus Distance Curves for Civil Aircraft, BBN Report 2759R, February 1976.

More recently, the civil aircraft noise and performance data have been reviewed and updated for the FAA. These data are incorporated in the current versions of the FAA's Integrated Noise Model (INM) airport noise computer program.

Bishop, D. E., Beckmann, J. M., Civil Aircraft Noise Data for Computation of Aircraft Noise Contours, BBN Report 4440 (draft), November 1980.

Potter, R. C., Mills, J. F., Aircraft Flight Profiles for Use in Aircraft Noise Prediction Models, BBN Report 4594 (draft), January 1981.

Following the original development of NOISEMAP, a series of research and sensitivity* studies concerned with various aspects of NOISEMAP assumptions and modeling algorithms has been undertaken. These studies are documented in the following Air Force reports:

Bishop, D. E., Dunderdale, T. C., Horonjeff, R. D., Mills, J. F., Sensitivity Studies of Community-Aircraft Noise Exposure (NOISEMAP) Predictive Procedure, Air Force Report AMRL-TR-75-115, March 1976 [AD A026535].

- Tone Corrections
- Runup Weightings
- Temperature and Pressure Altitude
- Excess Ground Attenuation and Airframe Shielding Algorithms

Bishop, D. E., Dunderdale, T. C., Horonjeff, R. D., Mills, J. F., Further Sensitivity Studies of Community-Aircraft Noise Exposure (NOISEMAP) Prediction Procedures, Air Force Report AMRL-TR-116, April 1977 [AD A041781].

- Tone Corrections
- Excess Ground Attenuation and Fuselage Shielding Models
- Climatic Variations

Fidell, S., Test Plan for Aircraft Runup Noise Penalty Evaluation, Air Force Report AMRL-TR-75-110, March 1976 [AD A026209].

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*Sensitiviety refers to the variability of noise contour size and shape resulting from changes in modeling algorithms or input data.

Walker, D. Q., Aircraft Sideline Noise: A Technical Review and Analysis of Contemporary Data, Air Force Report AMRL-TR-76-115, April 1977 [AD A042076].

Walker, D. W., An Analysis of Aircraft Flyover Noise, Air Force Report AMRL-TR-78-8, April 1978 [AD A058522].

Extended capabilities of NOISEMAP to include noise from helicopters and from special aircraft operations are described in the following reports:

Galloway, W. J., Helicopter Noise Level Functions for Use in Community Noise Analyses, Air Force Report AMRL-TR-78-87, December 1978.

Bishop, D. E., Procedures and Data for Predicting Day-Night levels for Supersonic Flight and Air-to-Ground Gunnery, BBN Report 3715, prepared for the Air Force Civil Engineering Center, (draft) August 1978.

The NOISEMAP program has been modified to permit convenient determination of demographic information within noise contour boundaries, as described in the following reports.

Seidman, H., Bavely, C., Computer-Aided Collection of Demographic Data within Day-Night Level Contours: Two Test Cases, Air Force Report AMRL-TR-78-39, August 1978.

Seidman, H., Incorporation of Environmental Impact Indices into NOISEMAP, Air Force Report AMRL-TR-81-31, February 1981.

Initial NOISEMAP field validation studies and the development of detailed techniques for field measurement of air base noise for comparison with NOISEMAP predictions have been undertaken. They are documented in the following reports:

Seidman, H., Horonjeff, R. D., Bishop, D. E., Validation of Aircraft Noise Exposure Prediction Procedure, Air Force Report AMRL-TR-76-111, April 1977 [AD A041674].

Rentz, P. E., Seidman, H., Development of NOISECHECK Technology for Measuring Aircraft Noise Exposure, Air Force Report AMRL-TR-78-125, May 1980.

Bishop, D. E., Harris, A. H., Mahoney, J., Rentz, P. E., NOISECHECK Procedures for Measuring Noise Exposure from Aircraft Operations, Air Force Report AMRL-TR-80-45, November 1980.

Lee, R. A., Field Studies of the Air Force Procedures (NOISECHECK) for Measuring Community Noise Exposure from Aircraft Operations, Air Force Report AMRL-TR-82-12, March 1982.

Additional NOISEMAP research studies are underway. Special effort has been made to extend the usability of the program for specific Air Force needs through the development of a special preprocessor program to handle military aircraft noise and performance data. Modeling concepts and algorithms, for instance those concerned with propagation over ground and the transition between air-to-ground and ground-to-ground propagation, are undergoing continuing study. Modification of NOISEMAP to allow convenient calculation of day-night levels at specified points, rather than computation at an array of grid positions, is being undertaken. The results of these studies will be described in future Air Force-sponsored reports.

APPENDIX D

ECOLOGY

Appendix D

Special-Status plant and wildlife species that may occur in the vicinity of Mather AFB

	Common and Scientific Name	Status[1] Federal[2]/State[3]/CNPS[3]	Distribution[4]
Insects	Sacramento Valley tiger beetle (Cicindela hirticollis abrupta)	2R/-/NA	S
	Valley elderberry longhorn beetle (Desmocerus californicus dimorphus)	FT/-/NA	S*
Amphibian	California tiger salamander (Ambystoma tigrinum californiense)	C2/CSC/NA	S
Reptile	Giant garter snake (Thamnophis couchi gigas)	C2/CT/NA	S
Birds	Burrowing owl (Speotyto cunicularia)	-/CSC/NA	K
	Swainson's hawk (Buteo swainsonii)	-/CT/NA	S*
	Tricolored blackbird (Agelaius tricolor)	-/CSC/NA	S*
Plants	Aharts rush (Juncus leiospermus var. aharti)	C1/-/1b	S
	Boggs Lake hedge-hyssop (Gratiola heterosepala)	C2/CE/1b	S*
	California hibiscus (Hibiscus californicus)	C2/-/1b	S
	Green's legenere (Legenere limosa)	C2/-/1b	S*

Appendix D. (continued)

Common and Scientific Name	Status[1] Federal[2]/State[3]/CNPS[3]	Distribution[4]
Green's tuctoria (Tuctoria greenei)	C1/CR/1b	S
Hairy orcutt grass (Orcuttia pilosa)	C1/CE/1b	S
Hoover's spurge (Chamaesyce hooveri)	C1/-/1b	S
Red Bluff rush (Juncus leiospermus var. leiospermus)	C2/-/1b	S
Sacramento orcutt grass (Orcuttia viscida)	C1/CE/1b	S*
Sanfords sagittaria (Sagittaria sanfordii)	C2/-/list3	S
San Joaquin Valley orcutt grass (Orcuttia viscida)	C1/CE/1b	S*
Slender orcutt grass (Orcuttia tenuis)	C1/CE/1b	S*

[1]Status definitions:

FT - Federal threatened
C1 - Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
C2 - Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
2R - Recommended for Category 2 status.
CE - Listed as endangered in the State of California.
CR - Listed as rare in the State of California.
CT - Listed as threatened in the State of California.
CSC - California Department of Fish and Game species of special concern
1b - Plants recognized as rare, threatened, or endangered in California and elsewhere by the California Native Plant Society (CNPS).
list 3 - Plants about which more information is needed by the CNPS.
NA - Not applicable

[2]Informal consultation with the U.S. Fish and Wildlife Service. Letter from G. C. Kobetich, U.S. FWS, to L. L. Sigal, ORNL, April 18, 1989.

[3]D. E. Warenycia, State of California Department of Fish and Game, Nongame Heritage Program, personal communication to L. L. Sigal, ORNL, March 7, 1989 and May 23, 1989.

R. L. Bittman, State of California Department of Fish and Game, Natural Diversity Data Base, (NDDB), personal communication to L. L. Sigal, ORNL, May 24, 1989.

[4]Distribution definitions:

K - Species known to be present on Mather AFB (Crowl 1985)

S - Species may occur at Mather AFB based on species habitat requirements and distributions and the presence of suitable habitat within the Base (Natural Diversity Data Base, State of California Department of Fish and Game).

S* - Species strongly suspected of occurring at Mather AFB (NDDB).

APPENDIX E

CURRENT ENVIRONMENTAL PERMITS FOR MATHER AFB

APPENDIX E. CURRENT ENVIRONMENTAL PERMITS FOR MATHER AFB

E.1 AIR EMISSIONS

Mather AFB has a number of permitted air pollution sources, as shown in Table E.1. Permits are granted by the Sacramento County Air Pollution Control District.

E.2 WASTEWATER DISCHARGES

The Clean Water Act (CWA) of 1972 and CWA Amendments of 1987 are the basic federal legislations which regulate the discharge of contaminated wastewaters to any navigable body of surface water of the United States. Under the Clean Water Act, both actual and proposed wastewater discharges from any point source are required to be permitted under the National Pollutant Discharge Elimination System (NPDES). A point source is defined as any conveyance which receives or may receive contaminated wastewaters. Controls and the allowable mass or concentration limits for various contaminants are found in the Code of Federal Regulations (CFR), 40 CFR 403 et. seq. In addition, regulations found in 40 CFR 122 establish conditions for NPDES permits and also provide for regulation of stormwater discharges from areas of industrial activity.

The CWA also regulates discharge of industrial wastewaters to local Publicly-Owned Treatment Works (POTW) under regulations found at 40 CFR 403. These regulations require local POTW's to establish pretreatment requirements for industrial wastewater discharges. The local POTW must establish requirements at least as stringent as the federally promulgated pretreatment standards. If the local POTW has received approval from the EPA for its pretreatment program, the requirements established by the POTW have primacy except where the POTW incorporates the federal requirements by reference.

Mather AFB has numerous sources of industrial and stormwater discharges including:

- Metal cleaning rinse water
- Surface preparation and painting operations effluents-Aircraft washracks effluents
- Vehicle and equipment washdown wastewaters
- Laboratory (Photo, Rental) effluents
- Run-off from industrial areas
- Non-point source run-off

Industrial wastewater generated at Mather AFB is discharged to the Sacramento County regional sewer. In addition, four holding ponds with a capacity of 83 acre-feet provide temporary holding capacity when needed. Industrial waste generated by Mather AFB is governed by the California Regional Water Quality Control Board (CRWQCB)

Table E.1. Permitted Air Pollution Sources, Mather Air Force Base, February 13, 1989

TOTAL NO. = 84

Permit No./ Type POC	Using Agency/Bldg. No./ Telephone Exten.	Description/Comments
5189, Baghouse Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Wheelabator, Mdl #45 Hopper needs emptying
5269, Baghouse Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Pangborn, Mdl #40825 Hopper needs emptying
5270, Baghouse Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	W W Sly, Mdl ELS Hopper needs emptying
5183, Blaster Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Walk-in vented to baghouse 5270
5186, Blaster Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	AF manufact. vented to baghouse 5263
5187, Blaster Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	W W Sly vented to baghouse 5189
7754, Blaster Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Vacublast vented to baghouse 5269
8857, Blaster Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Pangborn vented to own baghouse
5159, Boiler Mr Headley	323 ABG/DEMM-H, 650 ext 42598	Steam, 10,000 KBTU/Hr, DF-2
5160, Boiler Mr Headley	323 ABG/DEMM-H, 650 ext 42598	Steam, 10,000 KBTU/Hr, DF-2
7370, Boiler Mr Headley	323 ABG/DEMM-H, 10400 ext 42598	Hot water, 257.6 KBTU/Hr, DF-2
7419, Boiler Mr Headley	323 ABG/DEMM-H, 7010 ext 42598	Hot water, 481.7 KBTU/Hr, DF-2
7426, Boiler Mr Headley	323 ABG/DEMM-H, 8150 ext 42598	Hot water, 480 KBTU/Hr, DF-2
7427, Boiler Mr Headley	323 ABG/DEMM-H, 8150 ext 42598	Hot water, 840 KBTU/Hr, DF-2
7429, Boiler Mr Headley	323 ABG/DEMM-H, 18015 ext 42598	Hot water, 387.8 KBTU/Hr, DF-2
7430, Boiler Mr Headley	323 ABG/DEMM-H, 18018 ext 42598	Hot water, 987 KBTU/Hr, DF-2

Table E.1. (Cont.)

7431, Boiler Mr Headley	323 ABG/DEMM-H, 18020 ext 42598	Hot water, 135 KBTU/Hr, DF-2
7752, Boiler Mr Headley	323 ABG/DEMM-H, 7033 ext 42598	Hot water, 382 KBTU/Hr, DF-2
5173, Degreaser Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	2, 50 gal PD-680 tanks
7670, Degreaser Sgt White	320 FMS/MAFMD, 7020 est 4183	HOH cooled solvent vapor degreaser
7974, Degreaser Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	AF manufact., cold solvent Citrikleen
8198, Degreaser Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Citrikleen, vented to baghouse 5189
8601, Degreaser Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Delta industries vapor degreaser 1,1,1-trichloroethane
8773, Degreaser Mr Harrison	323 FMS, 4260 ext 42765	Changed from PD-680 to Citrikleen
8235, Paint Stripper Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Pangborn, El Dorado hot solution Vented to baghouse 5189
8236, Paint Stripper Mr Dittrich	323 CAMS/MASFFP, 4150 ext 42770	Pangborn, El Dorado hot solution Vented to baghouse 5189
5074, Fuel Dispenser Mr Greco	323 ABG/DEMM-F, 3272 ext 42229	Vapor recovery for 5072 and 5073
7103, Fuel Dispenser Mr Greco	323 ABG/DEMM-F, 3272 ext 42229	Bottom filling gas loading rack
7759, Fuel Dispenser Mr Greco	323 ABG/DEMM-F, 10360 ext 42229	
7863, Fuel Dispenser Mr Greco	323 ABG/DEMM-F, 3171 ext 42229	Gas storage and dispensing
7438, Furnace Mr Headley	323 ABG/DEMM-H, 8158 ext 42598	DF-2, removed Notify county and delete from list
7439, Furnace Mr Headley	323 ABG/DEMM-H, 10060 ext 42598	Switched to propane from DF-2 Notify county and delete from list
7441, Furnace Mr Headley	323 ABG/DEMM-H, 18051 ext 42598	DF-2
7750, Furnace Mr Headley	323 ABG/DEMM-H, 7010 ext 42598	DF-2

Table E.1. (Cont.)

7372, Generator Mr Hargraves	323 ABG/DEME-P, 650 ext 42027	Waukesha, Mdl-L5790DSU, 5178 CID Tested 2nd week of month
7373, Generator Mr Hargraves	323 ABG/DEME-P, 8157 ext 42027	Cummins Mdl TVA-1710G, 1710 CID Tested 3rd week of month
7374, Generator Mr Hargraves	323 ABG/DEME-P, 18011 ext 42027	Cummins Mdl TVA-1710G, 1710 CID Tested 3rd week of month
7855, Incinerator Mr Greco	323 ABG/DEMM-F, 4023 ext 42229	For JP-4 tanker truck loading
7856, Incinerator Mr Greco	323 ABG/DEMM-F, 7080/7090 ext 42229	For JP-4 transfer at hydrants
5177, Spray booth Mr Crivellone	323 FTW/MAN, 2950 ext 44870	Wet waterfall paint booth
5180, Spray booth Sgt Hill	323 CAMS/MAFFC, 4150 ext 4598	Dry filter paint booth (was a wet water-fall paint booth)
5181, Spray booth Sgt Hill	323 CAMS/MAFFC, 4150 ext 4598	Conversion to dry filter in-progress Was a wet waterfall paint booth
8192, Spray booth Sgt Franklin	323 TRNSPS/LGTM, 7052 ext 42975	Wet waterfall paint booth
5072, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 3272 ext 42229	UST (25k gal) Has vapor recovery syst. 5074
5073, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 3272 ext 42229	UST (25k gal) Has vapor recovery syst. 5074
6419, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 4020 ext 42229	Above ground bulk JP-4 storage 420,000 gal
6420, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 4023 ext 42229	JP-4 loading rack
6421, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 4005 ext 42229	Above ground bulk JP-4 storage 840,000 gal
6422, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6423, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6424, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6425, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant

Table E.1. (Cont.)

6426, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6427, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6428, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6429, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7080 ext 42229	50,000 gal UST at hydrant
6430, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6431, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6432, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6433, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6434, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6435, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6436, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
6437, Fuel tank syst Mr Greco	323 ABG/DEMM-F, 7090 ext 42229	50,000 gal UST at hydrant
8098, Fuel tank syst Mr Seday	323 FTW/EM, 3391 ext 43324	Above ground tank, contam. JP-4
8508, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 82L00558
8509, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00982
8510, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00985
8511, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00987
8512, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00989

Table E.1. (Cont.)

8513, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00990
8514, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00992
8515, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00993
8516, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00996
8517, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L01003
8518, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L01087
8519, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L01090
8520, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 72L00681
8521, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 83L00814
8522, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # 83L00803
8523, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # CJ6280-ANG
8524, JP-4 tank. truck Sgt Nickersen	323 TRNSPS ext 44686	Veh. ID # CJ6281-ANG
7371, Jet engine T-cell Sgt Wilkersen	323 FMS/MAFB, 4130 ext 44214	J-69 test cell
8159, Acrft wash process Sgt West	320 FMS/MAFFC, 7035 ext 42867	PD-680 part of wash

Order No. 83-093 and the Sacramento Regional Sanitation District Sewer Use Permit #21. Table E.2 lists 1988 wastewater flows from Mather AFB.

No NPDES permits govern Mather AFB at this time. The Sacramento Regional Sanitation District requires semiannual sampling reports from the plating and cleaning effluents. The district conducts their own monitoring at the county sewage lift station for BOD, COD, suspended solids, cyanide, and four heavy metals, and at the plating and cleaning shop discharge for cyanide and seven heavy metals.

Stormwater runoff at Mather AFB is discharged through drainage ditches into Morrison Creek at approximately the 7100 area. Oil/water separators in the West Ditch and South Ditch are used in emergencies to limit hazardous effluents off base. No compliance monitoring is required for stormwater runoff.

Table E.2. Mather AFB wastewater flows and pollutant levels for 1988[a]

Month	Flow (millions of gallons)		Biochemical Oxygen Demand (lbs)		Suspended solids (lbs)	
	Monthly	Daily Average	Monthly	Daily Average	Monthly	Daily Average
January	33.16	1.07	106,460	3,439	146,000	4,710
February	26.37	.942	100,070	3,574	142,520	5,090
March	25.91	.836	104,820	3,381	136,150	4,390
April	27.42	.914	89,170	2,972	124,610	4,020
May	27.91	.900	96,590	3,116	140,820	4,543
June	31.30	1.04	90,830	3,028	120,070	4,002
July	34.86	1.125	50,880	1,641	56,700	1,829
August	31.64	1.021	34,570	1,115	31,140	1,005
September	31.24	1.041	41,420	1,381	39,860	1,329
October	26.19	.845	41,500	1,339	38,220	1,233
November	24.78	.799	39,260	1,309	36,160	1,205
December	23.08	.745	45,800	1,477	44,840	1,446
Total	343.86	11.278	841,370	27,772	1,057,090	34,802

[a]Biochemical oxygen demand and suspended solids are the only pollutants governed by the wastewater treatment contract. The contract specifies an average flow of 0.80 million gallons/day, a biochemical oxygen loading of 1000 lbs/day (annual average), and a suspended solids load of 1000 lbs/day (annual average).

Source: Sacramento Regional County Sanitation District, Sewage Loadings and Capacities for Mather AFB, 1988, February 27, 1989.

APPENDIX F

AGENCY CONSULTATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Endangered Species Office
2800 Cottage Way, Room E-1823
Sacramento, California 95825-1846

In Reply Refer To:
1-1-89-SP-495

April 18, 1989

Lorene L. Sigal, Ph.D.
Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, Tennessee 37831

Subject: Species List for the Proposed Mather Air Force Base Closure and Re-use, Sacramento County, California

Dear Dr. Sigal

The attached list replies to your letter of March 7, 1989, requesting information on listed and proposed endangered and threatened species that may occur within the subject project area. Some pertinent information concerning the distribution, life history, habitat requirements, and published references for the listed species is also attached. This information may be helpful in preparing a biological assessment for this project, if one is required.

Information and maps concerning candidate species in California are available from the California Natural Diversity Data Base, a program of the California Department of Fish and Game. Address your request to: Ms. Elaine Hamby, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814 [(916) 324-0562)]. You should also request additional information from the Chief, California Department of Fish and Game, Non-Game Heritage Program (916) 324-8348.

We appreciate your concern for endangered species. If you have further questions, please call Peggie Kohl of our Sacramento Endangered Species Office at (916) 978-4866.

Sincerely,

for Gail C. Kobetich
Field Supervisor

Attachments

ATTACHMENT A

LISTED ENDANGERED AND THREATENED SPECIES AND
CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED
MATHER AIR FORCE BASE CLOSURE AND RE-USE
SACRAMENTO COUNTY, CALIFORNIA
(1-1-89-SP-495)

Listed Species

Invertebrates
valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

Candidate Species

Amphibians
California tiger salamander, *Ambystoma tigrinum californiense* (2)

Reptiles
giant garter snake, *Thamnophis couchi gigas* (2)

Invertebrates
Sacramento Valley tiger beetle, *Cicindela hirticollis abrupta* (2R)

Plants
Boggs Lake hedge-hyssop, *Gratiola heterosepala* (2)
Sacramento orcutt grass, *Orcuttia viscida* (1)
valley sagittaria, *Sagittaria sanfordii* (2)

(E)--Endangered (T)--Threatened (CH)--Critical Habitat
(1)--Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2)--Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
(2R)-Recommended for Category 2 status.

STATE OF CALIFORNIA – THE RESOURCES AGENCY GEORGE DEUKMEJIAN, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
POST OFFICE BOX 942896
SACRAMENTO, CALIFORNIA 94296-0001
(916) 445-8006

USAF890420A
May 16, 1989

J. Tim Ensminger, Project Leader
Energy Division, Bldg. 4500N, MS-6200
Oak Ridge National Laboratory
P. O. Box 2008
Oak Ridge, TN 37831

Re: Mather Air Force Base

Dear Mr. Ensminger:

Thank you for your letter regarding the closure of Mather Air Force Base in Sacramento County. Unfortunately, we are unable to provide the research assistance you requested, but you should have no difficulty obtaining the information from published documents. NEPA requirements are not the only issue, however.

Closure of Mather and other bases are federal undertakings subject to review under Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. The appropriate federal agency is responsible for compliance with Section 106, and our office reviews the agency's findings. For example, we expect the Air Force to initiate consultation with our office for the closure of Mather.

At this time, we are awaiting information on a possible national approach to base closures. In place of individual consultation for each military base, the Department of Defense and the Advisory Council on Historic Preservation may develop a nationwide agreement to take historic properties into account during base closures. Our role will depend on that agreement. In the meantime, we suggest that you consult the Air Force for guidance on the procedures to be followed under the National Historic Preservation Act.

We wish you luck in your efforts. If you have any questions, please call staff historian Dorene Clement at (916) 322-9600.

Sincerely,

Kathryn Gualtieri
State Historic Preservation Officer

C

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814-4794

June 6, 1989

REPLY TO
ATTENTION OF
Regulatory Section

Lorene L. Sigal, Ph.D.
Environmental Science Division
Oak Ridge National Laboratory
Post Office Box 2008
Oak Ridge, Tennessee 37831

Dear Ms. Sigal:

This is in response to your letter dated June 1, 1989 regarding the EIS for the closure of Mather Air Force Base.

Section 404 of the Clean Water Act requires Department of the Army approval prior to the discharge of any dredged or fill material into waters of the United States. Your letter states that there will be no construction or discharge into water or wetlands in connection with the closure action. Therefore, for the closing action only, a Section 404 permit will not be required.

If you have any further questions, please contact Phyllis Petras of this office at (916) 551-2272.

Sincerely,

Tom Skordal
Chief, Regulatory Unit 1

APPENDIX G

INSTALLATION RESTORATION PROGRAM ACTIVITIES AT MATHER AFB

APPENDIX G. INSTALLATION RESTORATION PROGRAM ACTIVITIES AT MATHER AFB

This Appendix highlights activities at Mather AFB that are related to the Installation Restoration Program of the U.S. Air Force. Text in this Appendix was excerpted from "U.S. Air Force Installation Restoration Program, Phase IVA Activities for Mather AFB, Draft Site Inspection Report, July 15, 1988.

G.1 PROGRAM BACKGROUND

In response to the Resource Conservation and Recovery Act (RCRA) of 1976 and in anticipation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the U.S. Air Force (USAF) implemented Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, dated June 1980 (rev. DEQPPM 81-5, December 1981) and the Installation Restoration Program (IRP) at USAF installations and facilities. The IRP is a multiphased investigative and remedial effort designed to identify and evaluate past material disposal or spill sites and to control resultant or potential migration of environmental contamination. The magnitude of contamination is quantified by analysis of appropriate soil, sediment, water, and air samples. Data from these analyses are used to asses potential risks to base personnel, the public welfare, and degradation of plant and animal ecosystems.

The IRP has been developed and implemented as follows:

- Phase I - Records Search and Hazard Assessment Rating Methodology (HARM) site ranking.
- Phase II - Confirmation and Quantification Studies (staged efforts)
- Phase III - Technology Development
- Phase IV - Remedial Action

Overall responsibility and administration of the IRP in the USAF is with the Directorate of Engineering and Services. Primary responsibility for managing IRP actions at installations and facilities is delegated to the major command (MAJCOM).

The MAJCOM for Mather Air Force Base (AFB) is Headquarters Air Training Command, Directorate Engineering and Environmental Planning (HQ ATC/DEV), Randolph AFB, San Antonio, Texas. Site management at the base level is coordinated under the base commander, 323rd Flight Training Wing, Environmental Management (323

FTW/EM). At the base level, a Technical Review Committee (TRC) comprised of representatives from the various USAF program management teams, regulatory agencies, and the neighboring community provides program oversight, comment, and recommendations for IRP activities.

G.2 OBJECTIVES OF SITE INSPECTION

Four separate IRP investigations (Phase I and Phase II; Stages 1, 2, and 3) have been completed at Mather AFB to identify and evaluate the extent of environmental contamination. The majority of sites at Mather AFB are discontinued solid waste disposal sites that may have resulted in soil and ground water contamination.

This Site Inspection Report (SIR) presents the results of the Site Inspection (SI) task. The SI was conducted to develop the first comprehensive, basewide evaluation of existing geologic and chemical data related to environmental contamination at Mather AFB. This SIR includes sampling, analytical, and monitoring well information obtained from the four previous on base investigations, as well as available off-base information acquired from private and state sources.

The objectives of the SI were to conduct an evaluation of all existing hydrogeologic and analytical data in the Mather AFB area, develop a comprehensive understanding of the identified waste disposal sites within the base boundary, and assess the presence and migration potential of contamination. A description of the tasks performed to acquire and evaluate the needed data are described below:

- Collected two rounds of water level measurements from all on-base monitoring wells to establish current hydrologic conditions.

- Reviewed for accuracy available well location, well construction, and ground water analytical data for existing on-base and off-base wells.

- Interpreted subsurface stratigraphic and depositional variations in sediment textures. Prepared areal and vertical facies distribution maps and stratigraphic cross sections based on data contained in well construction logs. Utilized this data to evaluate hydrogeology basewide and at individual IRP sites.

- Evaluated and listed applicable or relevant and appropriate requirements (ARARs) of the federal, State of California, and/or local regulations to be utilized and considered in the IRP investigations at Mather AFB.

- Assessed the potential for contamination to impact humans and other environmental receptors. Included in this assessment were evaluations of transport mechanisms, routes of contact, and waste characteristics. Existing

demographics, as well as trends in population growth and commercial and residential development were addressed.

- Developed recommendations for future work to more clearly define contaminant migration pathways. Identified data requirements for evaluating remedial action alternatives.

G.3 RECOMMENDATIONS

G.3.1 Main Base Area

Hydrogeologic Recommendation

- Install monitoring wells within Main Base area and along north perimeter.

  Rationale: Assess impacts on local ground water flow resulting from municipal well pumping north of base; evaluate contamination from existing identified/potential leaking USTs and sewer system east of Eknes Street (IRP Site 23).

Geochemical Recommendation

- Institute routine, quarterly well sampling and analysis program.

  Rationale: Characterize Main Base area and IRP sites with full-scan analyses and water level monitoring of existing and proposed wells.

G.3.2 Base Housing Area

Hydrogeologic Recommendation

- Install monitoring wells upgradient of existing base housing wells and institute routine sampling and monitoring.

  Rationale: Assess proximity of known contaminated water-bearing zones to nongrouted/nonsealed housing wells; wells will provide early warning detection for housing wells; evaluate effects of well pumpage for shallow aquifer leakage. Several of the housing wells are reported as constructed without annular grouting or seals and thus a potential pathway for contamination exists to comingle with other perforated zones.

Geochemical Recommendation

- Sediment sampling of surface drainages inflow and outflow through housing area.

  Rationale: Assess contamination potential and human/wildlife health risks resulting from identified or unidentified pollution sources drainage into these surface water courses.

G.3.3 Landfill Sites

Hydrogeologic Recommendation

- Install vadose zone monitoring.

  Rationale: To monitor and acquire vadose zone hydrologic data to satisfy SWAT requirements.

Geochemical Recommendation

- Surface and subsurface soil sampling at all sites identified in the Mather AFB SWAT Proposal to the CRWQCB.

  Rational: Analyze samples for substances and compounds to satisfy SWAT requirements.

- Sediment sampling of drainage ditches, culvert outflows, evaporation ponds at landfill IRP sites.

  Rationale: Sampling and analysis to evaluate seasonal leachate potential and pollution of intermittent or perinnal surface water flow, evaluate contamination potential via off-base drainages.

- Sediment sampling of surface water drainages and evaporation ponds within Northeast Landfills 3, 4, and 5.

  Rationale: Evaluate and analyze leachate and run-off contamination potential.

G.3.4 Mather Lake

Hydrogeologic Recommendation

- Install additional shallow and uppermost continued aquifer monitoring wells along northeast base boundary.

Rationale: Establish background water criteria in principal base on-flow area and monitor on-flow from auto dismantlers outside Douglas Gate.

G.3.5 West Ditch

Hydrogeologic Recommendation

- Install shallow ground water monitoring wells upgradient of ditch along Happy Lane and 1/4 mile west of Happy Lane. Conduct open hole geophysical logging and conduct routine monitoring.

  Rationale: Delineate subsurface areal extent of contamination and correlate known contaminated water-bearing strata to screened interval in existing private wells.

G.3.6 Other Recommendations

- Conduct surface geophysical investigation along alignment of "old" West Ditch, install monitoring wells, and sample sediment (backfill) and/or ground water.

  Rationale: Delineate location, size, and backfill material; assess its migration pathway potential as a contributing or intermediate contamination source, sample, and complete full-scan contaminate analysis.

- Routine sampling and analysis program of all existing and/or proposed monitoring wells and IRP sites.

  Rationale: Develop full-scan contaminate database for all sites/areas to characterize site and base-wide seasonal hydrologic and geochemical effects. Scope of analyses likely can be reduced after 1 year of monitoring and sampling.

- Install uppermost aquifer monitoring wells on 3/4 - mile centers (10 wells) throughout runways and base housing areas.

  Rationale: Infill monitoring well database to permit base-wide hydrogeologic characterization of aquifers and potentiometric reconciled flow gradient mapping.

- Install uppermost aquifer monitoring wells at center of designated IRP sites and upgradient of sites.

  Rationale: To characterize site-specific contamination concentrations and background levels to assist in remedial process design and alternative selection; assist in selecting cleanup level criteria (ARARs).

- Conduct cased borehole geophysical well surveys (seismic, gamma-density) of designated wells to assess integrity of seal, grout/cement bonding, filler pack interval, and screen location.

  Rationale: Several well completion records are incomplete, suspect, or analytical/water level observations indicate casing failure or poor bonding. The recommended geophysical surveys are not lithologic oriented , but provide physical well condition information.

- Conduct open-hole (uncased) geophysical well logs on all wells to total depth to include deep resistivity, neutron-density, and sonic logs.

  Rationale: Knowledgeable selected, operated, and calibrated well logs greatly assist in correlation of aquitard and aquifer units, physical/flow properties, and water-bearing zones.

- Completion cased wells to (1) keep gravel-packed interval to minimum required to monitor a single stratigraphic (aquifer) unit, (2) install minimum 5-foot thick bentonite annular seals (3) grout and/or seal (no well cuttings) uncased well bore to within 3 feet of the bottom of well screen, and (4) screen entire saturated interval or to 10 feet above static water depth in partially saturated zone of interest.

  Rationale: Numerous wells in the West Ditch area are incorrectly gravel packed or backfilled. It is essential that the specific monitoring zones of interest be isolated to correctly assess contamination concentrations and hydrologic gradients.

- Conduct extended aquifer pump testing or slug tests at West Ditch, AC&W, 7100 Area, and NE Landfill wells. Only selected wells at each site may be used to ensue correct interpretation of results for specific stratigraphic or monitored zones.

  Rationale: Aquifer flow properties for different lithotypes are essentially nonexistent or are limited, excluding Phase II, Stage 1 tests. This information is necessary for remedial process design and selection considerations and to characterize contaminant migration.

- Continuous lithologic cores of all strata down to approximately 200 feet at the West Ditch, AC&W, 7100 Area, NE Landfill, Main Base, and Base Housing Area.

  Rationale: Provide detailed subsurface, lithologic descriptions to characterize each principal site and samples for laboratory analysis of physical properties and sediment conformation. This information is intended to satisfy typical EPA requirements for site characterization.

- Conduct horizontal and altitude survey on all private wells within 1 mile of western base boundary and spot check the location of approximately 20 selected monitoring wells on base.

  Rationale: Correct location and elevation of off-base well is prerequisite to incorporating those wells into an off-base monitoring program and potentiometric surface mapping of ground water flow/usage in this area. Serious concerns regarding the existing on-base monitoring well locations survey have been identified. Reconciling the discrepancies and determination of the validity for the remaining location survey needs to be addressed for accurate areal site interpretations and potential audits by regulatory agencies.

- Quarterly monitoring for all on-base monitoring and production wells for VOCs.

  Rationale: Determine potential exposures to occupational and residential on-base receptors. This is particularly important for the six production wells serving the base residential area because these are downgradient of several sites, including the AC&W site.

- Sediment and surface water sampling at the West Ditch and Old West Ditch.

  Rationale: Determine potential exposures of the Happy Lane community to site-related chemicals present in the West Ditch area. Of particular concern are potential exposures through dermal contact and ingestion.

- Sampling of Morrison Creek at the southwest corner of the base.

  Rationale: Determine if Morrison Creek is a potential transport mechanism to the agricultural areas south of the base.

- Sampling of agricultural wells south of the base.

  Rationale: Determine if ground water is a potential migration pathway to off-base environmental receptors (livestock).

- Soil and sediment sampling at the south perimeter of the base.

  Rationale: Verify that site-related chemicals are not migrating off base in these media.

- Soil sampling in the base residential area.

  Rationale: Determine if residential receptors on-base (particularly children) are potentially exposed through this medium.

- Sediment and surface water sampling at Mather Lake along with monitoring well placement around the perimeter of the lake.

  Rationale: Mather Lake is downgradient of a light industrial area as well as the White Rock dump site. The data are necessary to establish if the lake poses a potential exposure pathway to human and environmental receptors.

APPENDIX H

ASSUMPTIONS FOR CLOSURE IMPLEMENTATION

APPENDIX H. ASSUMPTIONS FOR CLOSURE IMPLEMENTATION

This appendix details the assumptions and data used to construct the assumed scenario for how Mather AFB will be closed. The closure scenario was developed for impact assessment purposes only, and may not reflect the nature, extent, and timing of actual closure plans once they are developed.

Potential environmental impacts of implementing closure are related to the quantities and types of materials to be transported and also to the mode of transportation. Thus, for impact assessment purposes, it is necessary to estimate the quantity of material to be shipped, identify the mode(s) of shipment, and probable shipment routes.

Although air, rail, and truck shipments will be considered when developing detailed closure implementation plans, truck shipment will likely be selected as the preferred option given the short distances involved. For the purposes of this EIS, it is assumed that all shipments will be done by truck. The assumed truck shipments will also provide an upper bound of potential impacts in that since they are the smallest unit shipment (in terms of haul capacity), they would result in the highest level of shipment activity.

The number, frequency, and timing of the truck trips between Mather AFB and Beale and McClellan AFBs would affect the potential environmental effects associated with this action. To arrive at an estimate of the number of trucks needed, it is necessary to define the quantity of material to be shipped, which is in turn dependent upon the number of people to be moved.

The total working force, military and civilian, at the base is approximately 6,700 (Mather AFB ERIS 1988). The SAC 320th Bombardment Wing (BMW), which includes 14 B-52G aircraft and about 1,300 military and civilian personnel, is scheduled for withdrawal from Mather AFB by September 30, 1989, and thus would not be present for the baseline against which potential closure impacts are evaluated. The 323rd Flying Training Wing (FTW) includes about 3,200 military personnel and about 500 civilian employees or a total of approximately 3,700 personnel who will be moved to Beale AFB. The positions of approximately 200 support personnel would be deactivated or reassigned, and their equipment and materials shipped to the DMRO at McClellan AFB for disposal. The remaining personnel (about 1,500) are assumed to be associated with the Air Force Reserve 940th Air Refueling Group (ARG), which for the purposes of this EIS is assumed to be on hold (i.e., neither deactivated nor moved); the disposition of the 940th ARG will be addressed in a second EIS to be prepared for the reuse of Mather AFB. Weights of equipment and personal belongings are then estimated from the number of people involved in the moves.

It is assumed that all workstations contain a minimum of 1,500 lbs of equipment (personal communication, R. Cox, Holiday Van Lines, Knoxville, Tenn. with J. T. Ensminger, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 19, 1989), and that each employee represents a work station. Since many Mather personnel work in an industrial environment with equipment that is much heavier than the weight of the average office equipment, the pounds of equipment per workstation has been doubled to 3000 lb to account for the industrial equipment. Thus it is estimated that 11,100,000 lb of equipment and materials would be moved to Beale AFB and 600,000 lb would be moved to McClellan AFB.

In addition to equipment, personal belongings would also be moved. The quantity of personal belongings in turn depends on the number of employees plus dependents. For purposes of this study, it is conservatively assumed that each military member of the 323rd FTW (3,200) and each of their dependents (approximately 2,100) possesses a room, making a total of 5,300 rooms. Additionally, there are 1,271 on-base housing units and 2,255 off-base housing units occupied, or a total of 3,526. The 323rd FTW accounts for approximately 56% of the military population of the base; therefore, it is assumed to occupy the same percentage of the housing units or approximately 1,980. Each of these units normally contains a living room and kitchen, or 3,960 additional rooms, bringing the total number of rooms to 9,260. Based on residential moving experience (personal communication, Holiday Van Lines, Knoxville, Tenn. with J. T. Ensminger, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 19, 1989), residential materials typically weigh about 1000 lb/room. Thus, an estimated 9,260,000 lb of personal belongings would be shipped to Beale AFB.

The combination of working materials and equipment weight (11,100,000 lb) with personal belongings weight (9,260,000 lb) brings the total weight of materials to be moved to Beale AFB to an estimated 20,360,000 lb. Use of a tractor trailer weight per load of 18,000 lb (personal communication, R. Cox, Holiday Van Lines, Knoxville, Tenn. with J. T. Ensminger, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 19, 1989) and the total weight estimated to be moved allows the estimation of a conservative number of approximately 1,130 truck loads to move the possessions, equipment, and materials of the 323rd FTW to Beale AFB.

It is also assumed that each of the 1,980 housing units represents an individual military family which will travel to Beale AFB by personal vehicle, or 1,980 trips. Furthermore, it is assumed that the remaining unaccompanied military personnel (1,220) will be transported to Beale AFB via buses and trucks carrying an average load of 20 individuals per vehicle on 61 trips.

Each of the 318 vehicles of the 323rd FTW will be driven individually to Beale AFB. These include: 241 light duty vehicles (sedans, vans up to 15 passenger capacity, jeeps, and 1/4-1/2 ton trucks), 17 buses (16, 29, and 45 passenger), 49 heavy duty trucks, and 11 tractor trailer rigs (5-10 ton).

Shipment of the estimated 600,000 lb of equipment to be excessed through the DRMO at McClellan AFB is assumed to require about 33 truck loads. No other equipment transport is assumed to occur to McClellan AFB.